



H Ford

WWest imp

Mac Andrewia azorica



C.H. Ford

W. West. imp.

Myliusia callocyathes.

November 22, 1859.

Dr. Gray, V.P., in the Chair.

Mr. Daniel G. Elliot of New York exhibited three specimens of hybrid Ducks from his own collection, which had been obtained on the south shore of Long Island, U. S. A. One of these was considered to have been produced by a cross between the Wild Duck (*Anas boschas*) and Pintail (*Dafila acuta*), the second by the Wild Duck and Muscovy Duck (*Cairina moschata*), and the third probably by the American Scaup (*Fuligula affinis*) and the Canvas-back (*F. valisneria*) or the American Pochard (*F. americana*).

Dr. Hamilton exhibited three curiously plumaged Pheasants shot in Norfolk, which had the appearance of males on the lower surface and females on the upper. They were birds of the year. Upon careful dissection, no traces of sexual organs, either male or female, were discernible.

The following papers were read :—

1. DESCRIPTION OF MACANDREWIA AND MYLIUSIA, TWO NEW FORMS OF SPONGES. BY DR. J. E. GRAY, F.R.S., V.P.Z.S., P.E.S., ETC.

(Radiata, Pl. XV. XVI.)

In 1841 Mr. Stutchbury described in our Proceedings a Sponge brought from Barbadoes, in the Museum at Bristol, which was peculiar for being entirely formed of agglutinate silicious spicula, forming a tough semitransparent glass-like spongy mass. By exchange I have obtained half the specimen of this most curious and interesting sponge, so that I have the means of comparing those I have described with the one then made known.

In July 1851 Mr. R. MacAndrew kindly presented to the British Museum a Coral from St. Michael's, one of the Azores, which then attracted my attention, but I put it aside in hopes that I might obtain a specimen of it in spirits, which would enable me to understand more completely its history and character. No other specimen having, however, come under my examination, the subject dropped out of my mind.

It was accidentally placed with the Stony Corals, and its hardness and resemblance to the genus *Gemmipora* are some excuse for this mistake. Some time ago Mr. Holdsworth, when studying the corals in the Museum, observed that it evidently did not belong to that group : and a very superficial inspection, indeed its mere lightness, was enough to show that such was the case.

I again placed it aside, thinking that I had seen a figure of the animal as an *Alcyonium* in Messrs. Quoy and Gaimard's 'Voyage,' and in Dana's 'Zoophytes,' and that I would study it when I had

that family under my hands, or leave it for some other person to examine who might take up the group.

Having lately had occasion to consult Messrs. Quoy and Gaimard's work, and the essay of Mr. Dana, I became satisfied that the substance from the Azores could not be the *Aleyonium glaucum* or *Aleyonium latum* (Dana, Zooph. 623. t. 58. f. 6), which I had before thought from recollection might be the case; for these authors describe *A. glaucum* as soft and fleshy, and *A. latum* as "more rigid in its texture than *A. glaucum*." As Mr. MacAndrew's specimen is hard, inflexible, and brittle, though very light, this induced me to examine the specimen more carefully; and I then found that the supposed coral was a silicious sponge, covered below with a thin fleshy envelope without any apparent apertures, and above with a thicker fleshy coat, studded with large-sized, regularly-disposed, circular cells, which look like the cells of the Polypes in the two *Aleyonia* above referred to. The apertures are destitute of a radiating lamina, and appear in their dry state to be subdivided into six or eight small circular tubes, and have all the appearance of being the cells of a pinnated tentacled zoophyte. The small part of the lower surface of the spongy axis, which is exposed, is pierced with minute perforations, and the upper surface is furnished with groups of larger pores, which, as far as I can judge without injuring the specimen, are placed under the cells above described. There are grooves diverging from the small cylindrical perforations in one of the groups to the perforations in the other groups.

I have thought proper to call the genus after the gentleman who discovered it, and who has been very liberal in doing all in his power to extend our knowledge of zoology and geology, and has several times placed his yacht at the command of scientific men, to assist them in their researches.

The genus may be thus defined :—

MACANDREWIA.

Cup-shaped, expanded, more or less sinuated or lobed, affixed by a more solid dilated base, covered with a fleshy bark, which is furnished with cells on the upper surface, supported by a very light porous silicious spongy cup-shaped axis, the upper surface of which is furnished with groups of small cylindrical pores placed in roses, and with grooves radiating between each group of pores; the lower surface uniformly porous.

MACANDREWIA AZORICA. (Pl. XV.)

Hab. St. Michael's, Azores, 1851 (*Robert MacAndrew, Esq., F.R.S., &c.*).

This sponge? has so much the general appearance and habit of a zoophyte with pinnated tentacles like the *Aleyonium* to which I have referred above, that I am as yet by no means certain that it may not be the product of such animals; but I have not been able to find any traces of the remains of them, and therefore must wait the

arrival of some other specimen preserved in spirit to determine the fact. At the same time the bark is unlike that of any sponge that I am acquainted with, the existence of such a bark on any true sponge being as yet unknown to me. On the other hand, the existence of an axis of the spongy texture and the silicious compositions found in this marine body are novelties in the order of zoophytes in which its general appearance would lead one to place it. But that is no reason why it may not prove to be a zoophyte, as the same may be said to be the case with regard to the genus *Hyalonema*, the axis of which is so anomalous that several of the French zoologists—Valenciennes, Milne-Edwards, and others—considered the bark of it as a parasite on some unknown substance, overlooking the fact that the bark is strengthened by fibres exactly like those of which the axis is composed. Such an idea would require a belief in the existence of two bodies always found together, and unknown in any other form, instead of their being regarded as parts of the same animal.

The axis of this body has many characters in common with the body which is called a Sponge described by Mr. Stutchbury in our Proceedings for 1841, p. 87, as mentioned above under the name of *Dactylocalyx pumiceus*, and which has been more lately described under another name by M. Valenciennes, a very fine specimen of which is in my collection; but in this sponge it is the outer surface which is marked "with deep sinuosities radiating from the root to the outer circumference."

We have lately received from Dr. William MacGee of Belfast a very curious specimen of a silicious sponge?, which is also allied to the *Dactylocalyx* and *MacAndrewia*, but so distinct in its form and structure that I am inclined to regard it as a type of a new genus, which may be called

MYLIUSIA.

Sponge? silicious, funnel-shaped, fixed by the base; the upper surface smooth, marked with numerous minute perforations placed in nearly parallel grooves radiating from the centre to the circumference, and with numerous large, oblong, rather unequal-sized perforations, which are fringed on the lower side with a high wall of a similar structure to the rest of the sponge; these edges of the cavities causing the under surface to be covered with unequal irregular shaped tubes of nearly the same length, and more or less confluent together: some of these tubes are simple and subcylindrical, others are expanded out and more or less crumpled on the edge around the cavity, so as to end in two, three, or even four, more or less circular mouths.

MYLIUSIA CALLOCYATHES. (Pl. XVI.)

Hab. West Indies (*Dr. MacGee*).

Dr. Bowerbank informs me that the silicious spicula of this sponge are very different from those of *Dactylocalyx pumiceus*. As he is working on that subject, I leave the peculiarities for him to de-

scribe ; but I should not be in the least surprised if the genera *MacAndrewia*, *Myliusia*, and *Dactylocalyx* should all prove to be a peculiar family of zoophytes rather than sponges. If these bodies are sponges, they will form a family in that group, which may be named *MacAndrewiadæ*, characterized by the peculiar form and structure of the axis, the distinctness of the bark, and the position of the oscules or cells.

The structure of the base of *Dactylocalyx* and of the spicula which are found in the interspaces of the network are figured by Mr. Quekett in his 'Lecture on Histology.'

I have named this genus after Christlob Mylius, who first described the curious zoophyte since called *Umbellularia grænlandica* ; and I think that any one who reads his simple and plain account of the animal in his letter to Haller, and the account of the same animal given by John Ellis in his work on Corallines, will be satisfied that the latter was not very liberal in his praise towards his contemporary. There might have been reasons why he did not mention the name of Mylius, but I cannot conceive why those of Collinson and Dunze should have been omitted.

It is much to be regretted that nothing is known as to what became of the two specimens of this animal described by Mylius and Ellis, and that no other specimen has been found since that period, now more than a century ago.

2. ON SOME NEW OR LITTLE-KNOWN BIRDS FROM THE RIO NAPO.

By PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE SOCIETY.

Among some birds lately received from the Rio Napo, and kindly submitted to my inspection by M. Verreaux of Paris, are several species not included in the series from the same locality which I had the pleasure of bringing before the notice of the Society last year *. To these I now beg leave to call the Society's attention, some of them appearing to be new to science, and others, although already described, to be of rare occurrence.

1. *BASILEUTERUS NIGRI-CRISTATUS* (Lafr.).—*Myiothiolyptis nigri-cristata*, Bp. Consp. p. 311.

2. *DIGLOSSA ATERRIMA*, Lafr. Rev. Zool. 1846. p. 319.

3. *CALLISTE RUFIGULARIS*, Sclater, Mon. Call. pl. 13.

The occurrence of this species on the eastern side of the Andes is certainly singular, as M. Bourcier obtained his specimens at Calacali, on the western side of the great range.

4. *CALLISTE CHRYSOTIS*, DuBus ; Sclater, Mon. Call. pl. 43.

* See P. Z. S. 1858, p. 59.

5. *CALLISTE CYANOTIS*, Slater, P. Z. S. 1859, p. 294.

A specimen in more perfect plumage than the bird which I originally described from, but unmistakably recognizable as belonging to the same rare species. Its nearest ally is certainly *Calliste labradorides* (Mon. of *Calliste*, pl.), from which, however, it is easily distinguishable by the black sides of the head and well-defined superciliary stripe.

6. *BUARREMON CASTANEICEPS*, sp. nov.

Saturate oleagineus, subtus vix dilutior : remigibus et rectricibus nigricanti-fuscis : pileo castaneo, lateribus capitis cum gula nigricanti-cinereis : rostri nigricanti-plumbei basi pallida ; pedibus nigris.

Long. tota 6·5, alæ 3·1, caudæ 2·6.

But one example of this *Buarremon* was in the collection. It may be arranged next to *B. rufinuchus* and *B. latinuchus*, from which, however, it is easily distinguished by its general deep olive colouring.

7. *BUARREMON ASSIMILIS* (Lafr.).

Agrees with New Granadian specimens.

8. *GRALLARIA NUCHALIS*. sp. nov.

Saturate brunnescenti-oleaginea, pileo rufescentiore, nucha et regione post-oculari clare castaneis : subtus nigricanti-schistacea : rostro et pedibus nigris.

Long. tota 7·5, alæ 4·5, caudæ 2·1, rostri a rictu 1·2 ; tarsi 2·15.

This bird is a long-legged *Grallaria* in structure, though in plumage it rather resembles the different species of the allied genus *Formicarius*. I have never seen but this one example, now in my collection.

9. *PIPREOLA CHLOROLEPIDOTA*, Sw. An. in Men. p. 357.

This bird agrees so well with Swainson's description, that I have no hesitation in recognizing it as belonging to his species. It is a female of one of the beautiful green Cotingas of the genus *Euchlornis* or *Pyrhorrhynchus*, as I had always supposed was likely to be the case*. It is *probably* the female of *Euchlornis sclateri*, Cornalia (Contr. Orn. 1852, p. 133. pl. 4), which is from this same country ; but I am not yet clear upon this point. Its identification is of importance, as it proves that the generic name *Pipreola* should be used for this group, in place of *Euchlornis* or *Pyrhorrhynchus*, established many years subsequently.

* Annals of Natural History, June 1856.

3. ON SOME HYBRID DUCKS BRED IN THE SOCIETY'S GARDENS.
 BY PHILIP LUTLEY SCLATER, M.A., SECRETARY TO THE
 SOCIETY.

(Aves, Pl. CLVIII.)

I have the pleasure of exhibiting Mr. Wolf's drawing of both sexes of a Hybrid Duck bred this season in the Society's Gardens, between a male of the Common Sheldrake (*Tadorna vulpanser*) and a female of the White-fronted Sheldrake or Mountain Goose of Southern Africa (*Casarca cana*). The old female *Casarca* was acquired by the Society at the sale of the late Lord Derby's collection in 1851. She has on three previous occasions bred in the Gardens: in the first instance with an Indian male of the Ruddy Sheldrake (*Casarca rutila*), and subsequently twice with one of the male hybrids produced by her union with the Ruddy Sheldrake.

Upon being placed this spring in a small pond in company with a pair of the Common Sheldrake, she so persecuted the male with her attentions that she succeeded in persuading him to tread her, though in the society of his proper mate. The result was that she laid fertile eggs, and hatched and successfully reared three strong hybrid birds (Pl. CLVIII.), two of which appear to be males, and one a female. They present a curious combination of the colours of the two parents, though the dusky-grey flanks seem scarcely deducible from either. The female has the bill black; in the male it is flesh-coloured at the base, as in the male parent. The female also takes rather after her mother's likeness, in possessing white round the beak and round the eye. The black hood in both sexes is derived from the male parent.

In the Gardens this year we have also bred two other broods of Hybrid Ducks. One of these was the produce of a male Dusky Duck (*Anas obscura*), and a cross-bred female between the Dusky Duck and the Wild Duck. The other was the issue, as we believe, of parents themselves *both* cross-bred, and both originating from hybridism between the Tufted Duck (*Fuligula cristata*) and the White-eyed (*Nyroca leucophthalma*). But, as there is a male pure-bred White-eyed Duck in the same pond, we cannot be quite certain on this point.

During the next season we hope to take such measures as will put to test in the case of the *Anatidæ*, a favourite *dictum* of naturalists, and one which has recently met the approval of a high authority* upon such matters, that "it is difficult, perhaps impossible, to bring forward one case of the hybrid offspring of two animals *clearly distinct* being themselves perfectly fertile."

* Darwin, "On the Origin of Species," p. 26.



HYBRID

between TADORNA VULPANSER and CASARCA CANA

4. LIST OF MALAYAN BIRDS COLLECTED BY THEODORE CANTOR,
ESQ., M.D., WITH DESCRIPTIONS OF IMPERFECTLY-KNOWN
SPECIES. BY FREDERIC MOORE.

Part II.*

113. PASSER MONTANUS.

Fringilla montana, Linn. S. N. i. p. 324.

Passer montanus, Stephens, Shaw's Zool. xiv. p. 40; G. R. Gray, Gen. of B. ii. p. 372; Blyth, J. A. S. Beng. xiii. p. 947; xiv. p. 553; Catal. B. Mus. A. S. Beng. p. 120; Moore, Catal. B. Mus. E. I. C. ii. p. 500.

Specimens obtained at Singapore.

"This is the common sparrow of Java, and is the more common species in Arracan generally; about sixty of this species occurring to one of *Passer indicus*. It is also common in China and Japan, also in the Himalaya, and in Afghanistan, extending westward to the British Islands."—Blyth.

114. PADDA ORIZIVORA.

Loxia orizivora, Linn. S. N. i. p. 302 (Vieillot, Ois. Chant. t. 61).

Fringilla orizivora, Horsfield, Trans. Linn. Soc. xiii. p. 161; Swainson, Zool. Ill. 1st ser. t. 156.

Munia orizivora, Bonap. C. G. Av. p. 451.

Padda orizivora, Reichenbach (1854); Moore, Catal. Birds Mus. East Ind. Comp. ii. p. 504.

Oryzornis orizivora, Cabanis, Catal. Birds Mus. Heine, p. 174.

Loxia javensis, Sparrman, Mus. Carls. t. 89.

Orizivora leucotis, Blyth, Indian Ornithology, MSS.

GLATE, Java (Horsfield).

GELATIK, Sumatra (Raffles).

115. MUNIA PUNCTULARIA.

Loxia punctularia, Linn. S. N. i. p. 302.

Munia punctularia, Blyth, Catal. B. Mus. A. S. Beng. p. 117; Bonap. C. G. Av. p. 452; Moore, Catal. Birds Mus. E. I. C. ii. p. 505.

Fringilla punctularia, Horsfield, Trans. Linn. Soc. xiii. p. 161.

Amadina punctularia, Hay, J. A. S. Beng. xiv. p. 554.

Uroloncha punctularia, Cabanis, Catal. Birds Mus. Heine, p. 174.

Fringilla nisoria, Temm. Pl. Col. 500. f. 2.

Coccothraustes javensis naevia, Briss. Orn. iii. p. 239. t. 39. f. 2.

The Cowry Grosbeak, Latham.

PEKKING, Javanese (Horsfield).

From Pinang.

Distinguished from *M. undulatus*, Lath., by the whitish-grey on the rump, upper tail-coverts and tail, which is represented by glistering fulvous in *M. undulatus*.

* Continued from Proc. Zool. Soc. 1854, p. 285.

116. *MUNIA MAJA*.

Loxia maja, Linn. S. N. i. p. 301 (Vieill. Ois. Chant. t. 56).

Munia maja, Blyth, Catal. B. Mus. A. S. Beng. p. 116; Moore, Catal. B. Mus. E. I. C. ii. p. 505.

Fringilla maja, Horsfield, Trans. Linn. Soc. xiii. p. 162.

Dermophrys maja, Cabanis, Catal. B. Mus. Heine, p. 174.

Loxia leucocephala, Raffles, Trans. Linn. Soc. xiii. p. 314.

BONDOL, Java (Horsfield).

PIBIT, Sumatra (Raffles).

PETAP WHOBUN, Malays (Blyth).

From Pinang.

117. *MUNIA SINENSIS*.

Coccothraustes sinensis, Brisson, Orn. iii. p. 238.

Munia sinensis, Blyth, Catal. Birds, Mus. A. S. Beng. App. p. 337; Moore, Catal. Birds Mus. East Ind. Comp. ii. p. 508.

Loxia malacca, var. β , Linn. S. N. i. p. 302.

Munia malacca (part.), Bonap. C. G. Av. p. 432.

Loxia atricapilla, Vieillot, Ois. Chant. t. 53.

Chinese Sparrow, Edwards, Birds, t. 43.

Malacca Grosbeak, var. A, Lath. Hist. of B. v. p. 244.

Obtained at Pinang.

118. *MUNIA ACUTICAUDA*.

Munia acuticauda, Hodgson, As. Res. 1836, p. 153; Moore, Catal. Birds Mus. East Ind. Comp. ii. p. 510.

Amadina acuticauda, Blyth, J. A. S. Beng. xiii. p. 949; Strickland, P. Z. S. 1846, p. 103.

Amadina molucca, apud G. R. Gray, Gen. of B. ii. p. 370.

Uroloncha molucca, apud Cabanis, Catal. B. Mus. Heine, p. 173.

? *Loxia molucca*, Linn. S. N. i. p. 302; Lath. Hist. v. p. 246.

Sparp-tailed Munia, Hodgson.

PETAP, Pinang (Blyth).

From Malacca and Pinang.

This bird has the chin and throat *only* blackish, the breast being dark brown, with whitish shafts and borders to the feathers, and the belly dull white, with dusky pencillings; whereas in *M. striata* (Linn.) the throat, to breast inclusive, is uniform blackish, and the belly, vent, and flanks, white. The upper parts of both are nearly similar, but in *M. acuticauda* the brown colour is paler, and the upper tail-coverts are brown; in *M. striata* these being black.

Also inhabits Nepal, Assam, and Tenasserim.

119. *PLOCEUS BAYA*.

Ploceus baya, Blyth, J. A. S. Beng. xiii. p. 945 (1844).

Pinang and Malacca.

120. *EULABES JAVANENSIS*.

Corvus javanensis, Osbeck, It. p. 102 (1757); Edw. B. t. 17, lower fig.

Eulabes javanus, Cuvier, Règ. Anim.

Pastor musicus, Wagler, Syst. Av. Past. sp. 2.

Gracula religiosa, apud Horsfield et Raffles, Trans. Linn. Soc. xiii. pp. 162, 303.

The Malayan Grackle.

BE0 seu MENCH0, Java (Horsf.).

TIONG, Sumatra (Raffles).

Malacca.

Inhabits the Malayan peninsula and archipelago; also the Nicobar Islands.

121. ACRIDOTHERES FUSCUS.

Pastor fuscus, Wagler, Syst. Av. Past. sp. 6 (1827).

Acridotheres fuscus, Bonap. C. G. Av. p. 420; Moore, Catal. Birds Mus. E. I. C. ii. p. 537.

Pastor mahrattensis, Sykes, P. Z. S. 1832, p. 95.

Maina cristatelloides, Hodgs. J. A. S. Beng. v. p. 771 (1836).

Acridotheres griseus, apud Blyth, J. A. S. Beng. xv. p. 33; id. Catal. B. Mus. A. S. Beng. p. 108.

From Pinang and Malacca.

Identical with specimens from Tenasserim, China, and Nepal; and differs from South Indian examples only in being greyer.

122. CALORNIS DAURICUS.

Sturnus dauricus, Pallas, Acta Stockh. iii. p. 198. pl. 7. f. 1 (1778).

Turdus striga, Raffles.

Pastor malayensis, Eyton, P. Z. S. 1839, p. 103.

BRASS-BRASS, Malays.

Malacca.

“Eyes black; legs greenish-brown. Sleeps with the body downwards, suspended by the claws. Common at Malacca.”—*Dr. Cantor's MS.*

123. CALORNIS CHALYBEUS.

Turdus chalybeus ♂ et *T. strigatus* ♀, Horsfield, Trans. Linn. Soc. xiii. p. 148 (1820).

Lanius insidiator, Raffles, id. p. 307 ♂.

Lamprotornis cantor, apud Temm. Pl. Col. 149.

TERLING seu PARLIONG, Malays.

From Malacca.

124. CORVUS CULMINATUS,

Corvus culminatus, Sykes, P. Z. S. 1832, p. 96; Blyth, J. A. S. Beng. xv. p. 24, xvi. p. 727; Moore, Catal. Birds Mus. E. I. C. ii. p. 553.

Corvus corax, apud Raffles, Trans. Linn. Soc. xiii. p. 300?

BURONG GAGA-GAGA, Malays.

An adult and young specimen from Pinang, agreeing with Tenasserim and Indian examples.

Remark.—*C. macrorhynchus* is distinct from this, and occurs also at Malacca, and, according to Mr. Blyth (J. A. S. xv. p. 24), "is a much slyer bird, with a different caw, and a longer beak."

125. *PLATYSMURUS LEUCOPTERUS*.

Glaucopis leucopterus, Temm. Pl. Col. 265.

Glenargus leucopterus, Cabanis, Catal. B. Mus. Heine, p. 216.

TALONG-GAGA or KOLONG-GAGA, Malays.

Inhabits Malacca.

126. *PLATYLOPHUS GALERICULATUS*.

Corvus galericulatus, Cuvier, Règ. Anim. i. p. 399 (1817); Levaill. Ois. de Parad. t. 42.

Platylophus galericulatus, Swainson, Classif. of B. p. 263; Moore, Catal. Birds Mus. E. I. C. ii. p. 574.

Lophocitta galericulata, G. R. Gray, Gen. of B. ii. p. 305; Blyth, Catal. B. Mus. A. S. Beng. p. 94; Bonap. C. G. Av. p. 374; P. Z. S. 1850, p. 79; Cabanis, Cat. B. Mus. Heine, p. 218.

Lanius scapulatus, Lichtenstein, Doubl. p. 49.

Lanius coronatus, Raffles, Trans. Linn. Soc. 1822, p. 306 (female).

Vanga cristata, Griffith's An. Kingd. p. 486 (male).

Lophocitta histrionica, Müller, Bonap. C. G. Av. p. 374; P. Z. S. 1850, p. 79 (female).

Garrula rufula, Temminck, Mus. Lugdens. (female).

Lophocitta ardesiaca, Cabanis, Catal. B. Mus. Heine, p. 219; Bonap. C. G. Av. p. 374 (young male).

BURONG JERI, Sumatra (Raffles).

"Common at Malacca."—*Dr. Cantor's MS.*

127. *RHINOPLAX SCUTATUS*.

Buceros scutatus, Boddart, Tabl. des Pl. Enl. d'Aubent. (1783).

Buceros galeatus, Gmel.

TIBBANG MUNTOVAH, Malays (Farquhar).

From Keddah, Malay Peninsula.

"Iris, eyelids, pouch, legs, and feet, Indian red."—*Dr. Cantor's MS.*

128. *BUCEROS RHINOCEROS*.

Buceros rhinoceros, Linn. (Pl. Enl. 934; Levaill. Ois. d'Amer. et Ind. t. 1, 2; Edw. B. t. 281. f. B); Bontius, Java, t. 64; Raffles, Trans. Linn. xiii. p. 291; Blyth, J. A. S. Beng. xii. p. 993; xiv. p. 188; xvi. p. 993; Moore, Catal. Birds Mus. E. I. C. ii. p. 582.

Buceros africanus, Gmelin, S. N. i. p. 359.

Buceros niger, Shaw, Zool. viii. p. 7 (Levaill. t. 13).

Buceros lunatus, Temm. Pl. Col. 546.

Buceros sylvestris, Vieillot.

Buceros diadematus, Dumont.

INGGANG DANTO, Malays (Raffles).

BURONG TAUN, Sumatra (Marsden).

RANGKOK OF YONGRANG, Java (Horsfield).

Male and female obtained at Malacca.

"The sexes of this Hornbill are distinguished by the *posterior* surface of the horn, above the forehead, being black in the male, and concolorous with the rest of the horn in the female; besides which the male has a black line dividing the bill and casque, and continued forward and upward upon the latter, parallel with its anterior margin. It may be remarked further, that this species seems to wear away the cutting edges of its mandibles more than any other; so that, when the tips meet, a wide hollow occurs along the medial portion of its bill."—*Blyth*.

129. HOMRAIUS BICORNIS.

Buceros bicornis, Linn. (Levaill. Ois. d'Am. et Ind. t. 7, 8).

Homraius bicornis, Bonap. Ateneo Ital. (1854); Moore, Catal. Birds Mus. E. I. C. ii. p. 583.

Buceros cavatus, Shaw (Levaill. t. 3, 4, 5); Raffles, Trans. Linn. Soc. xiii. p. 291; Gould, Cent. of B. tab. 44; Jerdon, Madras Journ. xi. p. 37; Blyth, J. A. S. Beng. xii. p. 986; xiv. p. 187; xvi. p. 993; Tickell, J. A. S. Beng. xxiv. p. 279.

Buceros homrai, Hodgson, J. A. S. Beng. i. p. 251 (1832); Asiatic Res. 1833, p. 169, tab.

Bifid-casqued Hornbill, Shaw.

Concave-casqued Hornbill, Shaw.

BAN RAO (*i. e.* Jungle King), Masuri (Hutton).

HOMRAI, Nepal (Hodgson).

GARUDA, natives of Forests of S. India (Jerdon).

MALAH-MORAYKEY, Malyalum (Elliot).

YOUNY-YENG, Arracan (Phayre).

BURONG-OONDAN, Malays (Raffles).

INGGANG PAPAN, Sumatra (Raffles).

Adult male from Malacca, and adult and young female from Penang.

"This bird inhabits the extensive hill forests of all India, Assam, Arracan, Tenasserim, Malayan Peninsula, and Sumatra. It does not appear to be subject to any variation of plumage, either sexual or according to age; but there are some differences in the colouring of the bill and casque of the sexes, and also of the irides."—*Blyth*.

Mr. Hodgson in his description states that "the casque and upper mandible are deep waxen-yellow, passing to rich red on the top of the casque, and towards the tip of upper mandible; the tip itself and the lower mandible ivory white; base of both mandibles, anterior and posterior surface of the casque, a line along the ridge of the bill, its cutting edges, and the whole inner surface of the bill, and naked skin round the eyes, black; iris intense crimson. The female, and young of a year old, has the iris pure hoary, the naked skin of the ophthalmic region pale purpurescent dusky; and the black colour which distinguishes the casque, and ridge, cutting edges, and interior surface of the bill in the male, being red.

"From a comparison of many specimens, showing both sexes in maturity, and the young in various stages of progression towards it, I am led to conclude that the body does not reach its full size under two or three years, and that the bill and casque, especially the latter, are not perfectly developed in less than four or five years."

Mr. Hodgson also gives an elaborate description of the growth of the young, and also a description of the skeleton by Dr. M. J. Bramley. An account of its anatomy is given by Prof. Owen in the Proc. Zool. Soc. 1833, p. 102.

The Rev. J. Mason, in his work on Burmah, states of the Concave Hornbill, "Their nests are constructed in a superior manner of clay in the stumps or hollows of old trees. After the female has laid five or six eggs, the male bird shuts her entirely in with mud, except a small hole where she can only peep out her head. Here she must sit during her incubation, for if she breaks through the enclosure, her life pays the forfeit; but, to compensate for the loss of freedom, her spirited mate is ever on the alert to gratify his dainty mistress, who compels him to bring all her viands unbroken, for if a fig or any fruit be injured, she will not touch it."

Capt. Tickell, writing from the Tenasserim provinces, remarks: "I obtained the egg of *B. cavatus*, and have *seen with my own eyes* that the male builds the female in, by covering the hole in the tree where she incubates with mud, leaving only room for her bill to protrude and receive food from his! I thought that this was a fable."—J. A. S. Beng. 1855, p. 279.

130. HYDROCISSA CONVEXA.

Buceros convexus, Temm. Pl. Col. 530 (♀).

Hydrocissa convexa, Moore, Catal. Birds Mus. E. I. C. ii. p. 591.

Buceros intermedius, Blyth, J. A. S. Beng. 1847, p. 994; xviii. p. 803; Catal. Birds Mus. A. S. Beng. p. 43.

Buceros albirostris, apud Horsfield, Trans. Linn. Soc. xiii. p. 175.

Buceros malabaricus, apud Raffles, id. p. 291; Vigors, App. Mem. Raffles, p. 666.

Buceros violaceus, apud Hay, Madras Journ. xiii. pt. 2. p. 148.

KLINGLINGAN, Java (Horsfield).

ANGKA ANGKA, Sumatra (Raffles).

MATTEE SEE-AWAN, Malays (Cantor).

Adult males from Malacca, and adult and young of both sexes from Pinang.

In plumage this species is like *H. albirostris* (Shaw), but with the four lateral pairs of tail feathers wholly white in adults (in the young these are black at base), and the middle pair tipped with white.

Bill and casque yellowish-white, the latter with a black patch, as in *H. albirostris*. "Naked space round the eyes and sides of throat bluish-white."—Dr. Cantor.

131. HYDROCISSA MALAYANA.

Buceros malayanus, Raffles, Trans. Linn. Soc. xiii. p. 292 (1822);

Temminck, Text de Pl. Col. ; Blyth, J. A. S. Beng. xvi. p. 995 ; xviii. p. 803 ; Catal. B. Mus. A. S. Beng. p. 43.

Hydrocissa malayana, Bonap. C. G. Av. p. 90 ; Moore, Catal. Birds Mus. E. I. C. ii. p. 592.

Buceros anthracinus, Temm. Text. de Pl. Col. 529.

Buceros bicolor, Eyton, P. Z. S. 1839, p. 104 ; Blyth, J. A. S. Beng. xii. p. 995.

Buceros elliotti, Hay, Madras Journ. xiii. pt. 2. p. 152.

QUAY QUAY, Malays (Eyton).

MATTEE SEE-CAWAN, Malays (Cantor).

Two female specimens from Province Wellesley, Malacca.

In the presumed *immature* male the plumage is wholly glossy-black, excepting a superciliary coronal circle and tips of the four outer tail-feathers, which are white ; the bill and casque are spotless yellowish-white, excepting the base of the former and hindmost part of the latter, which are black ; the casque sloping gradually in front to the curvature of the bill. Length of wing $10\frac{1}{2}$ inches ; of tail $12\frac{1}{2}$ inches, its outer feather 3 inches less ; bill from gape $4\frac{3}{4}$ inches, from hindmost part of casque to point of bill, in a straight line, 6 inches, height from chin to top of casque 3 inches.

Presumed *adult* female has the superciliary coronal circle represented by obscure silvery-greyish. Length of wing $13\frac{1}{2}$ inches ; of tail 16 inches ; outermost feather 4 inches less ; bill from gape $5\frac{1}{4}$ to 6 inches ; length of casque 5 to $5\frac{3}{4}$ inches ; height from chin to top of casque 3 to $3\frac{1}{2}$ inches.

The casque in this species is allied in shape to that of *H. albirostris* and *H. convexa*, and is of a totally different form to that of *H. nigrirostris*.

The female, according to Dr. Cantor's notes, has the "Iris greyish-brown. Bill yellowish-white or buff. Naked space round the eyes livid. Feet black."

132. HYDROCISSA NIGRIROSTRIS.

Buceros nigrirostris, Blyth, J. A. S. Beng. xvi. p. 995 (1847) ; xviii. p. 803 ; Catal. B. Mus. A. S. Beng. p. 44.

Hydrocissa nigrirostris, Moore, Catal. Birds Mus. E. I. C. ii. p. 593.

Buceros malayanus, apud Lord A. Hay, Madras Journ. xiii. pt. 2. p. 151.

QUAY QUAY, Malays (Cantor).

Male and female obtained at Malacca.

Plumage in the presumed *male* glossy-greenish black, including the chin and throat, which, and the underparts, are less glossy ; head adorned with a broad yellowish-white superciliary coronal circle ; tips of the four outer tail-feathers yellowish-white ; space round the eyes and basal angle of lower mandible naked, and in the dry specimen yellowish. Presumed *female* as in male, excepting that the superciliary circle is represented by obscure silvery-greyish. Bill and casque blackish, "and in the young," says Mr. Blyth, "white,

the form of the casque is low, thinly compressed towards the front, and abruptly truncate anteriorly, with a longitudinal ridge on each side in old birds, occasioning a broad shallow groove above and another below it. Length about 29 inches; of wing $11\frac{3}{4}$ inches; tail to tip of middle feathers 13 inches; to tip of outer feather $10\frac{1}{2}$ inches; bill from gape $4\frac{3}{4}$ inches; length of casque 3 inches; height from chin to top of casque $2\frac{1}{2}$ inches.

Mr. A. R. Wallace states, in a letter from Singapore (Ann. Nat. Hist. Feb. 1855), that "*B. nigrirostris* is the female of *B. malayanus*, Raffles; I satisfied myself of this fact from the dissection of about a dozen specimens shot off the same tree."

The bill and casque of *B. malayanus* are allied in form to the corresponding parts of *H. albirostris* and *H. convexus*, Temm; and that of *H. nigrirostris* to that of the next species.

We have described these birds as *male* and *female* on the authority of Dr. Cantor.

133. ANORRHINUS GALERITUS.

Buceros galeritus, Temm. Pl. Col. 520.

Hydrocissa galerita, Bonap. Consp. Gen. Av. p. 90.

Anorrhinus galeritus, Reichenbach, Syst. Av. (1849); Moore, Catal. Birds Mus. E. I. C. ii. p. 594.

Buceros carinatus, Blyth, J. A. S. Beng. xiv. p. 187 (1845), xvi. p. 996.

QUAY QUAY, Malays (Cantor).

Colour green-glossed black, with the basal two-thirds of the tail drab-coloured, the wing-feathers slightly margined paler: head fully crested, composed of broad longish feathers. Throat naked, or merely showing two single rows of ill-developed feathers along the middle. Bill and casque black in the one sex, which seems always to have the abdominal region pale; in the other yellowish-white, with black along the summit of the casque nearly to the end, and also occupying the basal two-thirds of the lower mandible, and the tomæ of the upper one, and, according to Dr. Cantor's MS. notes, the "iris vandyke-brown; naked space round the eyes, and pouch black. Feet greenish-grey." The casque is low, and with a keel-shaped ridge, sloping off to the front.

"In a young specimen," remarks Mr. Blyth, "the plumage is quite similar to that of the adult, but has no trace of casque, and the bill is nigrescent with a whitish ridge and tip."

Several specimens obtained at Malacca.

134. BERENICORNIS COMATUS.

Buceros comatus, Raffles, Trans. Linn. Soc. xiii. p. 339 (1822); Schlegel et Müller, Verh. Naturl. Gesch. Aves, p. 29. t. 4; Temm. Text. de Pl. Col.; Hay, Madras Journ. xiii. pt. 2. p. 149; Blyth, J. A. S. Beng. xvi. p. 996. t. 44. f. 2 ♀.

Berenicornis comatus, Bonap. C. G. Av. p. 91; Moore, Catal. Birds Mus. E. I. C. ii. p. 594.

Buceros lugubris, Begbie, Ann. Nat. Hist. xvii. p. 405.

A single specimen of the female obtained at Malacca.

In this species the adult males have the finely plumed head, neck, breast, abdomen, tail, and tips of the wings pure white; the remainder being black, a little tinged with brown upon the back: whereas the females have the neck, breast, and abdomen, also black. Raffles described the young male only with "back, wings, and tail, of a dark brown; the belly of the same colour, mixed with white; and the wing- and tail-feathers all tipped with white at their points." Colour of the beak and casque dusky, the former laterally whitish towards its base. Throat moderately well feathered.

Size rather large, intermediate to *B. pica* and *B. rhinoceros*, with proportionally long and broad cuneated tail.

Inhabits the Malayan Peninsula and Sumatra.

135. RHYTICEROS PLICATUS.

Buceros plicatus, Lath. Ind. Orn. i. p. 146 (Levaillant, Ois. d'Afr. t. 239 ♂).

Rhyticeros plicatus, Reichenbach, Syst. Av. (1849); Moore, Catal. Birds Mus. E. I. C. ii. p. 598.

Calao plicatus, Bonap. C. G. Av. p. 90.

Buceros obscurus, Gmelin.

Buceros undulatus, Shaw (Levaill. Ois. d'Am. et Ind. t. 20, 21 ♀); Horsfield, Trans. Linn. Soc. xiii. p. 175.

Buceros javanicus, Shaw (Levaill. Ois. d'Am. et Ind. t. 22, jun.).

Buceros javanus et niger, Vieillot.

Buceros annulatus, Drapiez.

Buceros pusaran, Raffles, Trans. Linn. Soc. xiii. p. 293; Blyth, J. A. S. Beng. xii. p. 990; xvi. p. 998.

Wreathed Hornbill, Lath. Syn. i. p. 358.

Adult and young male and female obtained at Pinang.

"Male with the medial part of the crown and the whole occiput and nape dark rufous bay, or deep marronne, and the sides of the head and neck, with the front of the latter glistening yellowish-white; all the other parts are greenish-glossed black, except the tail, which is buffy-white. Bill yellowish-white, the basal portion of both mandibles dark reddish-brown laterally, with a series of narrow transverse, whitish ridges, nearly similar to those of *Rhyticeros cassidix*; the casque is scarcely elevated above the outline of the rest of the upper mandible, but is broad and flat above, having a series of narrow transverse plaits, the intervals between which are nearly filled up with a brownish substance, so that the profile is almost even, and towards the front is quite so. Length above 3 feet; of wing 19 inches; tail $10\frac{1}{2}$ inches; bill to gape $7\frac{1}{2}$ inches, and with casque 3 inches high, the latter nearly 2 inches broad."

"The female has the head and neck also black, and is smaller in size. In the full-grown young, the lateral ridges of the bill do not appear," remarks Mr. Blyth, "till after three or four corrugations are exhibited on the casque, prior to which the bill much resembles that of *B. nipalensis* Hodgs., of corresponding age, except that the bulge in place of the casque is more decided."

Dr. Cantor states that "the male has the bill [yellowish] white. Iris pale crimson. Gular pouch rich gamboge yellow. Feet blackish, and the female has the iris narrow, golden round the pupil, the rest golden vandyke. Eyelids brick-colour. Pouch dirty azure, with two transverse black lines. Feet blackish-grey. The young male has the iris mother o'pearl colour. Bill yellow at the point, and bluish-green at the base. Space round the eyes and pouch yellow, with the transverse black bars indistinct. Feet bluish-black."

Inhabits Sylhet, Arracan, Tenasserim Provinces, Malayan Peninsula, and Sumatra. The Rev. J. Barbe states (J. A. S. Beng. x. p. 922) that "both this species and *R. subruficollis*, Blyth, are very common in the Tenasserim provinces, associating in flocks of a dozen or twenty birds, but the two species do not mingle in the same flock."

R. subruficollis Blyth, J. A. S. Beng. 1843, p. 177, may be distinguished from *R. plicatus* by its much inferior size, though, the wings and tail being proportionally longer, the difference in actual admeasurements is not great, though that of the weight would be considerable; the casque is also much more elevate and highly convex, instead of being flattened above; there are also no lateral transverse ridges at the basal part of the mandibles. "In the living bird," says the Rev. J. Barbe, "the naked skin of the throat and around the eyes is of a beautiful blue, instead of yellow, as in *R. plicatus*." Length about 32 inches; of wing $16\frac{1}{2}$ inches; tail $9\frac{1}{2}$ inches; bill to gape $6\frac{1}{2}$ inches, and with its casque nearly 3 inches high, of which the latter occupies a full inch; it is also broad behind, becoming gradually narrower to the point, whereas that of *R. plicatus* is much more uniform in its breadth throughout.

136. PSITTINUS MALACCENSIS.

Psittacus malaccensis, Lath.* Ind. Orn. i. p. 130 (1790); Swains. Zool. Ill. t. 154.

Psittinus malaccensis, Blyth, J. A. S. Beng. xi. p. 789 (1842); Moore, Catal. Birds Mus. E. I. C. ii. p. 608.

Psittacus incertus, Shaw, Nat. Misc. t. 769.

Agapornis azureus (Temm.), Bonap. C. G. Av. p. 6.

Psittacula reticulata, Lesson.

TANA, Malaya.

Male: crown, rump, and upper tail-coverts bright purplish smalt-blue, passing into greyish on the nape, and then to greyish-dusky on the back; under-parts yellowish-olivaceous, the medial portion being tinged with brownish-ruddy, and edged with bluish; lower tail-coverts yellowish-green, tipped with blue; tibial plumes mingled blue and green; uropygials deep green; and the rest of the tail-feathers yellow, more or less green-edged; wing-feathers deep green, margined with yellowish on the coverts, except those of the primaries, secondaries, tertiaries, speculars, and shoulder, which are bluish or

* But not of Gmelin.

purple; extreme edge of shoulder yellowish-green; wing-spot marrone, and the coverts underneath the wing and axillaries crimson.

Female: crown greenish-marrone, on the forehead lighter and bluish, passing on the nape to the deep green of the back; the blue of the rump and upper tail-coverts is tinged with bright green; sides of face intermixed yellowish-marrone; throat greenish-yellow; underparts light-green; wing, wing-spot, under wing-coverts, and axillaries as in male.

Young: lighter green, yellowish beneath, and more broadly margined with yellow on the wings; forehead and rump bluish; upper tail-coverts bright green; wing-spot, under wing-coverts, and axillaries as in adults.

The upper mandible in the male is bright coral-red, paler at the tip; the under mandible dusky, in female lighter; in the young yellowish-white; and, according to Dr. Cantor's notes, "has the inner ring of the iris greenish, outer ring pale yellow; feet dark green."

From Pinang.

137. *PALÆORNIS TORQUATUS*.

Psittaca torquata, Brisson (Lear, Psitt. t. 33).

From Pinang.

138. *PALÆORNIS LONGICAUDA*.

Psittacus longicaudus, Boddært, Tabl. des Pl. Enl. d'Aub. p. 53 (1783); Gould, Birds of Asia, 1853, plate.

Psittacus malaccensis, Gmelin.

Pal. erythrogenys, Lesson (nec Blyth, nec Fraser).

Adult and young from Pinang and Malacca.

The young has the plumage yellowish-green, darkest on the crown, and palest beneath; a still darker green moustachial streak; space before the eye, slightly above, broadly beneath, and on lower part of ear-covert ferruginous, intermixed with greenish-yellow; upper part of ear-covert green, slightly tinged with verditer; wings above yellowish-green, and having the primaries, secondaries, portion of tertiaries, and speculars indigo-blue on their outer webs, and the three former narrowly edged with yellow; under wing-coverts and axillaries green; rump bluish-green, upper tail-coverts yellowish-green; tail above green, tinged with indigo-blue, and edged with yellowish-green, beneath dusky golden-yellowish; upper mandible red, pale at tip; under mandible also pale.

Length 8 inches, of wing $5\frac{3}{8}$ inches; tail 3 inches, its outermost feather 1 inch less; tarsus $\frac{7}{10}$ inch; outer fore-toe $\frac{8}{10}$ inch; ditto with claw $1\frac{1}{8}$ inch.

139. *PALÆORNIS CANICEPS*.

Palæornis caniceps, Blyth, J. A. S. Beng. pp. 23, 51, 368 (1846); id. xix. p. 233; Moore, Catal. Birds Mus. E. I. C. ii. p. 621; Gould, Birds of Asia, 1857, plate.

Male: general colour vivid yellowish-green, with the winglet and base of the secondaries indigo-blue, and the medial portion of the secondaries inclining to emerald-green; primaries black, the longest tinged with indigo towards the base; cap grey; a broad black frontal band, continued to the eyes, and a broad black moustache, with some black feathers also on the throat; above the moustache, between it and the frontal band, the feathers are of the same grey colour as those of the crown; tail green above, with some blue on its middle feathers, and dull golden-yellowish below; upper mandible coral-red, tip white; lower mandible black. The *female* differs in having the head less pure grey, and the bill is wholly black, and the primaries dull black, margined with dark grass-green. Length of female about 20 inches, of which the middle tail-feathers occupy $9\frac{1}{2}$; of wing 7 inches.

The female has the "iris golden-yellow; bill black; feet blackish-grey."—*Cantor's Notes*.

A single female from Pinang, being the only example that has as yet been brought to Europe. Inhabits also the Nicobar Islands.

140. LORICULUS GALGULUS.

Psittacus galgulus, Linn. (Pl. Enl. 190; Edw. B. t. 293. f. 2).

SEREN-DAK, Sindada, Malacca.

From Malacca.

141. EOS RUBRA.

Psittacus rubra, Gmel. S. N. i. p. 335 (Pl. Enl. 519; Edw. B. t. 173; Le Vaill. Perr. t. 93, 94).

Locality not stated.

142. MEGALAIMA CHRYSOPOGON.

Bucco chrysopogon, Temm. Pl. Col. 285.

Malacca.

143. MEGALAIMA VERSICOLOR.

Bucco versicolor, Raffles, Trans. Linn. Soc. xiii. p. 284 (1822).

Bucco rafflesi, Lesson, Rev. Zool. (1839) p. 137.

TAKOOR, Malays.

From Pinang and Malacca.

144. MEGALAIMA MYSTACOPHANOS.

Bucco mystacophanos, Temm. Pl. Col. 315.

Bucco quadricolor, Eyton, P. Z. S. 1839, p. 105.

TAKOOR CAPATA CUNING, Malays.

From Malacca.

145. MEGALAIMA INDICA.

Bucco indicus, Lath. Ind. Orn. i. p. 205 (1790).

Megalaima philippensis auctorum.

Bucco rafflesius, Boie (nec Lesson).

CHANDA, Malays of Sumatra (Raffles).

From Keddah and Province Wellesley, Malacca.

146. MEGALAIMA DUVAUCELLI.

Bucco duvaucelli, Lesson, Tr. d'Orn. p. 164 (1831).

Bucco trimaculatus, Gray, Zool. Misc. (1832) p. 3. t. 3.

Bucco frontalis, Temm. Pl. Col. 536. f. 1; Guérin, Icon. Règ. Anim. Aves, t. 34.

Bucco australis apud Raffles.

Bucco cyanotis, Blyth, J. A. S. Beng. (1847) p. 465, variety.

TANDA or TANHAK, Malays.

Adult and young from Malacca.

Inhabits the Malayan peninsula, Sumatra, with a variety in Arracan, and Tenasserim, having the ear-coverts of the same verditer-blue as the throat, and the crimson spots much weaker.

147. MEGALORHYNCHUS HAYI.

Bucco hayii, J. E. Gray, Zool. Misc. p. 33 (1832).

Micropogon fuliginosus, Temm. Text. de Pl. Col.

Megalorhynchus spinosus, Eyton, P. Z. S. 1839, p. 106.

Bucco lathamii apud Raffles.

ARIKO BERINE, Malays (Eyton).

UNKOT BESEA, Pinang (Dr. Cantor).

Malacca.

148. HEMICERCUS CONCRETUS.

Picus concretus, Reinwardt, Temm. Pl. Col. 90. f. 1, 2.

Dendrocopus sordidus, Eyton, Ann. Nat. Hist. xvi. p. 229.

Picus hartlaubii, Malherbe, MS. Mus. Ind. House.

Malacca.

149. REINWARDTIPICUS VALIDUS.

Picus validus, (Reinwardt) Wagler, Syst. Av. Pic. sp. 13 (1827); Temm. Pl. Col. 378 ♂, 402 ♀.

Adult and young from Malacca.

150. MULLERIPICUS PULVERULENTUS.

♂ *Picus pulverulentus*, Temm. Pl. Col. 389; Less. Tr. d'Orn. p. 222.

♀ *Picus mackloti*, Wagler, Syst. Av. Pict. sp. 4 (1827).

♂ *Picus javensis* (♀, nec ♂), Horsfield, Trans. Linn. Soc. xiii. p. 176.

♂ *Picus horsfieldii* (♀, nec ♂), Wagler, Syst. Av. Pic. sp. 5. Pinang.

"Bill, iris, and feet blackish."—Cantor's Notes.

151. MULLERIPICUS JAVENSIS.

Picus javensis (♂, nec ♀), Horsfield, Trans. Linn. Soc. xiii. p. 175 (1821).

Picus leucogaster, Reinwardt, Temm. Pl. Col. 501.

Picus horsfieldii (♂, nec ♀), Wagler.

Picus crawfordii, J. E. Gray, Griff. An. Kingd. Aves, ii. p. 513, fig.
GULATOH, Malays.
Malacca.

152. *CHRYSOCOLAPTES SULTANEUS*.

Picus sultaneus, Hodgson, J. A. S. Beng. vi. p. 105 (1837).

Picus strenuus (Gould), McClelland, P. Z. S. 1839, p. 165.

Picus strictus apud Jerdon et Blyth.

From Pinang.

Also inhabits India generally, chiefly the hill-forests, being rare in the plains; also Assam, Bootan, Sylhet, Arracan, Tenasserim, and Malayan peninsula southward as far as Malacca.

153. *CHRYSONOTUS INTERMEDIUS*.

Tiga intermedia, Blyth, J. A. S. Beng. xiv. p. 193 (1845).

Picus Tiga apud J. E. Gray, Ill. Ind. Zool. i. t. 30. f. 2.

From Pinang.

Intermediate in size between *C. shorei*, Vig., and *C. tiga*, Horsf. Common also in Nepal, Assam, Sylhet, Tipperah, Arracan, Tenasserim, and Southern India.

154. *CHRYSONOTUS (?) RAFFLESII*.

Picus rafflesii, Vigors, App. Memoir, Raffles, p. 669 (1829); Strickl. P. Z. S. 1846, p. 103.

Picus labarum, Lesson.

Tiga amictus, G. R. Gray, Gen. of B. ii. p. 441.

Malacca. Also inhabits Sumatra.

155. *VENILIA PUNICEA*.

Picus puniceus, Horsf. Trans. Linn. Soc. xiii. p. 170 (1827); Temm. Pl. Col. 423.

Malacca.

The figure in Temminck's Pl. Col. is that of the male bird, the female differing only in the absence of the crimson whiskers. Inhabits the Tenasserim provinces, Malayan peninsula, Sumatra, and Java.

156. *VENILIA MINIATA*.

Picus miniatus, Forster, Ind. Zool. p. 14. t. 4; J. E. Gray, Ill. Ind. Zool. i. t. 30. f. 1.

Picus malaccensis, Lath. Ind. Orn. i. p. 241.

GLATO MERRA, Malays.

Malacca.

157. *VENILIA MENTALIS*.

Picus mentalis, Temm. Pl. Col. 384.

Picus gularis, Wagler, Syst. Av. Pict. sp. 89 (1827).

Malacca.

158. *VENILIA MELANOGAstra*.

Picus melanogaster, Hay, Madras Journ. Lit. & Sci. xiii. pt. 2. p. 153 (1844).

Picus rubiginosus, Eyton, Ann. N. H. 1845, p. 229.

GLATO GADING, Malays (Cantor).

Malacca.

159. *MICROPTERNUS BADIUS*.

Picus badius, Raffles, Trans. Linn. Soc. xiii. p. 289 (1821).

Picus brachyurus, Vieill. Nat. Dict. xxvi. p. 103.

Picus phæopus, Malherbe, MS. Mus. Ind. House.

GLATO AHBOS, Malays.

Malacca.

"Iris, bill, and feet black."—*Cantor's Notes*.

160. *MEIGLYPTES TRISTIS*.

Picus tristis, Horsf. Trans. Linn. Soc. xiii. p. 177 (1821).

Picus poicilophus, Temm. Pl. Col. 197. f. 1.

GLATO BAWAN, Malays.

Pinang and Malacca.

161. *MEIGLYPTES BRUNNEUS*.

Hemicercus brunneus, Eyton, P. Z. S. 1839, p. 106.

GLATO ETAM, Malays.

Malacca.

162. *PICUS MOLUCCENSIS*.

Picus moluccensis, Gmel. S. N. i. p. 439 (Pl. Enl. 748. f. 2).

Tripsurus auritus, Eyton, Ann. N. H. 1845, p. 229.

Malacca. Inhabits the Malayan peninsula, Sumatra, and Java.

As compared with the Indian species (*P. variegatus*, Wagl. figured in Gray's Ill. Ind. Zool.), this has rather larger bill and feet; the crown is darker coloured, passing to blackish, or deeply infuscated, on the occiput and median line of nape; the wings are shorter, and there is a difference in the barring of the tail-feathers, and in the form of the tips of the more outer ones, which in the Indian bird are more rounded, or somewhat truncated, with a slight emargination at the tip of the shaft; while in the Malayan bird they attenuate, and are obtusely pointed; the white bars also assume more the appearance of transverse bands in the Malayan species, and of separated round spots in the Indian, while the outermost feather is in the former tipped with white, and the penultimate has an all but terminal white bar, both these feathers in the Indian bird being broadly black-tipped, with a more interrupted white bar above.

163. *CENTROPUS VIRIDIS*.

Cuculus viridis, Scopoli, Del. Flor. et Faun. Insub. (1786).

Cuculus bengalensis, Gmel. S. N. i. p. 412 (1788).

Centropus affinis ♂ et *C. lepidus* ♀, Horsf. Trans. Linn. Soc. xiii. p. 180.

Pinang and Malacca.

164. PHÆNICOPHAUS CURVIROSTRIS.

Cuculus curvirostris, Shaw, Nat. Misc. t. 905.

KADO BESAR, Malays.

Malacca. A common species at Malacca.

165. ZANCLOSTOMUS JAVANICUS.

Phœnicophaus javanicus, Horsf. Trans. Linn. Soc. xiii. p. 178 ;
id. Zool. Res. in Java, t. 57.

KAKA APIE, Malays.

Malacca.

166. ZANCLOSTOMUS SUMATRANUS.

Cuculus sumatranus, Raffles, Trans. Linn. Soc. xiii. p. 287 (1821).

Phœnicophaus crawfordii, J. E. Gray, Zool. Misc. p. 3. t. 2 (1832).

Malacca.

167. ZANCLOSTOMUS DIARDI.

Melias diardi, Lesson, Tr. d'Orn. (1831) p. 132.

CADOW KACHIE, Malays.

Malacca.

168. RHINORTHA CHLOROPHÆA.

♀ *Cuculus chlorophæus*, Raffles, Trans. Linn. Soc. xiii. p. 288
(1821).

♂ *Rhinortha caniceps*, Vigors.

♀ *Coccyzus badius*, J. E. Gray, Zool. Misc. p. 3. t. 1 (1832).

♀ *Phœnicophaus viridirostris*, Eyton, P. Z. S. 1839, p. 105.

SLAYA, SEE-SAYA, Malays.

Pinang and Malacca.

169. POLYPHASIA MERULINA.

Cuculus merulinus, Scopoli, Del. Flor. et Faun. Insub. (1786) ;
Sonnerat's Voy. t. 81.

Cuculus flavus, Gmel. (Pl. Enl. 814).

Pinang.

"Iris pale lake-colour ; legs pale orange."—*Cantor's Notes*.

170. POLYPHASIA TENUIROSTRIS.

Cuculus tenuirostris, J. E. Gray, Ill. Ind. Zool. ii. t. 34. f. 1 (1833).

Pinang.

171. POLYPHASIA SONNERATI.

Cuculus sonneratii, Lath. Ind. Orn. i. p. 215 (1790).

Cuculus pravata, Horsf. Trans. Linn. Soc. xiii. p. 179.

Cuculus venustus, Jerdon, Madras Journ. Lit. et Sc. xiii. pt. 2.
p. 140.

Malacca.

172. COCCYSTES COROMANDUS.

Cuculus coromandus, Linn. S. N. i. p. 171 (Pl. Enl. 274. f. 1).

Cuculus collaris, Vieillot (Le Vaill. Ois. d'Afr. t. 213).

Red-winged Crested Cuckoo.

Pinang.

173. SURNICULUS LUGUBRIS.

Cuculus lugubris, Horsfield (Zool. Res. in Java, t. 58).

Cuculus albopunctatus, Drapiez.

Malayan Drongo-Cuckoo.

Malacca.

174. HIEROCOCCYX VARIUS.

Cuculus varius, Vahl (Strickland, Ann. N. H. xviii. p. 399).

Cuculus fugax, Horsfield, Trans. Linn. Soc. xiii. p. 178 (1821).

Cuculus lathamii, J. E. Gray, Ill. Ind. Zool. ii. t. 34. f. 2.

C. nasicolor, Hodgs. J. A. S. Beng. xii. p. 943.

Malacca.

175. ? CUCULUS STRIATUS.

Cuculus striatus, Drapiez, Dict. Class. d'Hist. Nat.

Cuculus micropterus, Gould, P. Z. S. 1837, p. 137.

Young specimens, Malacca.

176. CHRYSOCOCCYX MALAYANUS.

Cuculus malayanus, Raffles, Trans. Linn. Soc. xiii. p. 286 (1821).

Cuculus lucidus apud Temm. Pl. Col. t. 102. f. 1.

Malacca.

177. EUDYNAMYS ORIENTALIS (Linn.).

Adult and young, Malacca.

178. HARPACTES DUVAUCELI.

Trogon duvaucelii, Temm. Pl. Col. 291 ; Gould, Monogr. Trog. pl. 32.

Trogon rutilus, Vieill. Nouv. Dict. d'Hist. Nat. 2nd ed. viii. p. 313 ;
Le Vaill. Hist. Nat. des Cour. t. 14.

Harpactes duvauceli, Gould, Birds of Asia, 1859.

Trogon kasumba (jun.), Raffles.

RAMGUBA, Malays.

Malacca (Cantor).

Male : head and throat jet black ; breast, under-surface, rump, and upper tail-coverts fine scarlet ; back reddish cinnamon brown ; wings black, coverts and secondaries crossed by numerous white lines ; primaries margined basally externally with white ; two medial rectrices dark cinnamon brown, tipped with black ; the two next blackish-brown ; the three outer being blackish-brown at the base, and largely tipped with white. Female differs in having the head dark-brown ; back dark cinnamon-brown, lighter and suffused with scarlet on the

rump and upper tail-coverts ; wing-coverts crossed with ochreous lines ; under surface orange-brown, washed with scarlet on the abdomen and under tail-coverts.

179. *HARPACTES KASUMBA*.

Trogon kasumba (adult), Raffles, Trans. Linn. Soc. xiii. p. 282 (1821).

Trogon fasciatus, Temm. Pl. Col. 321.

Trogon temminckii, Gould, Monogr. Trog. t. 29.

Harpactes kasumba, Gould, Birds of Asia, 1856.

BURONG KASUMBA, Malays.

Malacca.

180. *HARPACTES DIARDI*.

Trogon diardi. Temm. Pl. Col. 541.

Harpactes diardi, Gould, Monogr. Trog. t. 30.

Malacca.

181. *ARACHNOTHERA FLAVIGASTRA*.

Anthreptes flavigaster, Eyton, P. Z. S. 1839, p. 105.

Arachnothera flavigaster, Blyth, J. A. S. Beng. xii. p. 981 ; xiv. p. 557 ; xv. p. 43.

Arachnoraphis flavigaster, Reichenbach (1854).

CHICHAP RIMBA, Malays (Eyton).

COLEECHAP PANGONE, Malays (Blyth).

CHRECHUP BASAR, Malacca.

From Malacca.

Length about 8 inches ; of wing 4 ; tail 2 ; bill to forehead $1\frac{3}{4}$; and tarse $\frac{7}{8}$ ths.

182. *ARACHNOTHERA CHRYSOGENYS*.

Arachnothera chrysogenys, Temm. Pl. Col. 388. f. 1 (1826).

Arachnothera flavigenis, Swains. Classif. of B. ii. p. 329 (1837).

Certhia longirostra, apud Horsfield, Trans. Linn. Soc. xiii. p. 167.

PRIT-ANDUN, Java (Horsf.).

SIAP JANTUNG, Sumatra (Raffles).

Remark.—*A. chrysogenys* and *A. flavigaster* are allied, but the former is much less in size, and the latter has a broad circle of yellow feathers surrounding the eye, in addition to the ear-tuft ; whereas *A. chrysogenys* is naked under the eye, and has a semicircle of yellow feathers above it.

183. *ARACHNOTHERA MODESTA*.

Anthreptes modesta, Eyton, P. Z. S. 1839, p. 105.

Arachnothera modesta, Blyth, J. A. S. Beng. xii. p. 981.

Arachnothera latirostris, Blyth, J. A. S. Beng. xii. p. 982 (1843).

CHICHAP NIO, Malays (Eyton).

Upper-parts bright yellowish olive-green, the lower pale ashy-green, and obscurely striated ; lower tail-coverts tipped with whitish ;

tail with a subterminal dusky band, all but the medial two pairs having a well-defined pure white spot near the extremity of the outer web, successively larger to the outermost. Bill dusky-brown, pale below. Feet yellowish. Length 6 inches; of wing $2\frac{7}{8}$; middle rectrices $1\frac{3}{4}$ inch, the outermost above $\frac{3}{8}$ less; bill to forehead $1\frac{1}{4}$ inch; tarse $\frac{5}{8}$ inch.

Malacca.

184. *ÆTHOPYGA SIPARAJA*.

♂ *Certhia siparaja*, Raffles, Trans. Linn. Soc. xiii. p. 299 (1822); Vigors, Mem. Raffles, p. 673.

Nectarinia siparaja, Jardine, Nat. Libr. Nect. pp. 235, 273.

Nectarinia mystacalis, Temm. Pl. Col. 126. f. 3 ♂; Müller, Verh. Naturl. Gesch. Ned. Ind. Zool. Aves, p. 54. pl. 9. f. 1 ♀.

♂ *Nectarinia lathamii*, Jardine, Nat. Libr. Nect. pp. 233, 268 (1842).

SIPA-RAJA, Sumatra (Raffles).

Sir Stamford Raffles in his description of this species evidently omitted describing the rump as *yellow*. This I find is the case upon examining a typical drawing from his collection, and also specimens before me from Pinang.

Jardine's description of *N. lathamii* certainly agrees with this species, both in the colour of the crown, and deep yellow of the rump, and in the gradation of the tail-feathers; but I have still some doubt about Temminck's *N. mystacalis*.

Pinang.

185. *ANTHREPTES MALACCENSIS*.

Certhia malaccensis, Scopoli, Del. Floræ et Faunæ Insub. (1786); Sonn. Voy. pl. 116. f. 1.

Anthothreptes malaccensis, Cabanis, Catal. B. Mus. Heine, p. 104.

Certhia lepida, Sparrman, Mus. Carls. pl. 35 (1787).

Nectarinia lepida, Temm. Pl. Col. 126. f. 1, 2.

Nectarinia javanica, Horsf. Trans. Linn. Soc. xiii. p. 167 (1820).

Cinnyricinclia javanica, Reichenbach (1854).

PRIT-GANTIL, Java (Horsf.).

From Malacca and Pinang.

Inhabits the Burmese and Malay countries, Java, Sumatra, Borneo, and Macassar (Wallace).

186. *ANTHREPTES HYPOGRAMMICA*.

♂ *Nectarinia hypogrammica*, Müller, Verh. Nat. Gesch. Ned. Ind. Zool. Aves, p. 63. pl. 8. f. 3 (1839-44).

♀ *Anthreptes macularia*, Blyth, J. A. S. Beng. xi. p. 107 (1842).

♂ *Anthreptes nuchalis*, Blyth, J. A. S. Beng. xii. p. 980 (1843).

Hypogramma nuchalis, Reichenbach (1854).

Upper parts rich dark olive-green; the tail dusky, its outer feathers successively more broadly margined with whitish, chiefly on their inner webs; base of hind-neck and the upper tail-coverts (of the male only) brilliant steel-blue; under-parts streaky, each

feather being broadly marked with dark olive-green along the middle, and laterally margined with pale sulphur-yellow, brightest on the belly. Bill dusky-brown. Legs leaden-colour. Length about $5\frac{1}{2}$ inches; of wing $2\frac{5}{8}$; tail $1\frac{7}{8}$; bill to forehead above $\frac{3}{4}$; and but little curved; and tarse $\frac{5}{8}$ inch.

From Pinang.

Inhabits the Malayan Peninsula, Sumatra, Borneo.

187. CYRTOSTOMUS FLAMMAXILLARIS.

Nectarinia flammaxillaris, Blyth, J. A. S. Beng. xiv. p. 557 (1845); xv. p. 370.

Nectarinia jugularis apud Blyth, J. A. S. Beng. xii. p. 979.

Male. Colour of the upper-parts dull olive-green, brightening a little on the rump; beneath moderately bright chrome-yellow; and the axillary tuft intense yellow, with flame-colour anteriorly; throat and front of neck very dark glossy purple, margined laterally and at the gorget with bright steel-purple, below which is a narrow cross-band of dark red.

Female. Colours similar, except in wanting the axillary tuft, and having the throat and fore-neck yellow, like the rest of the lower-parts. Tail blackish, its outermost feathers tipped with pure white, this successively decreasing in quantity on the two or three next.

Length $4\frac{1}{8}$; wing $2\frac{1}{8}$; tail $1\frac{5}{8}$; bill to forehead $\frac{5}{8}$; tarse $\frac{1}{2}$ inch.

A presumed young male has the chin and middle of neck to breast dark glossy purple, with a few steel-blue feathers laterally from the chin, the sides of the neck from base of bill being yellow; no flame-coloured axillary tuft.

From Pinang. Also inhabits Arracan and Tenasserim.

188. LEPTOCOMA HASSELTII.

Nectarinia hasseltii, Temminck, Pl. Col. 376. f. 3; Jardine, Nat. Libr. Nect. pp. 218, 262. pl. 22; Müller et Schlegel, Verh. Nat. Gesch. Zool. Aves, p. 59. pl. 10. f. 5 ♀.

Leptocoma hasseltii, Cabanis, Catal. B. Mus. Heine, p. 104.

Certhia brasiliensis, Shaw, Zool. viii. p. 257.

Certhia sperata apud Raffles, Trans. Linn. Soc. xiii. p. 298.

Nectarinia phayrei, Blyth, J. A. S. Beng. xii. p. 1008 (1843).

CHIRICHIT, CHECHAP seu SIAP, Sumatra (Raffles).

Male. Crown brilliant golden-green; cheeks, sides and back of neck, interscapularies, and wings, deep black; tail also black, but richly glossed with purple; scapularies, rump, and upper tail-coverts brilliant steel-blue; throat and fore-neck splendid amethystine-purple; breast and flanks anteriorly rich dark red, posteriorly with the vent and under tail-coverts dull greyish-black.

Female. Upper-parts including the shoulder and upper tail-coverts dull olive-green; crown tinged with grey; wings dusky-black, the larger range of wing-coverts margined with grey, the primaries with cinnamon-yellow; tail blue-black; cheeks, throat,

and breast, dull greenish-yellow ; abdomen and under tail-coverts pale yellow, the abdomen more or less tinged with dark chrome-yellow. Length $3\frac{3}{4}$ inches ; wing $1\frac{7}{8}$ inch ; tail $1\frac{1}{4}$ inch ; bill to forehead $\frac{1}{2}$ inch.

Obtained plentifully at Pinang and Malacca. Also inhabits Borneo, Sumatra, Tenasserim, and Arracan.

189. CHALCOPARIA PHÆNICOTIS.

Nectarinia phænicotis, Temm. Pl. Col. 108. f. 1 ♂. 388 ; f. 2 ♀ (182).

Anthreptes phænicotis, Blyth, J. A. S. Beng. xii. p. 979 (1843) ; xiv. p. 557.

Nectarinia cingalensis, Gray, Gen. of B. i. p. 99.

Chalcoparia cingalensis, Cabanis, Catal. B. Mus. Heine, p. 103.

? *Motacilla cingalensis*, Gmel. S. N. i. p. 964 (Brown's Ill. pl. 32).

Male. Upper-parts glossy bronzed-green, including the crown and wing-coverts ; upper tail coverts glossy-green, without the bronzing ; rest of the wings and tail dusky, the latter margined exteriorly with shining-green, and the secondaries and tertiaries with faint purple ; throat, fore-neck, and breast, light-ferruginous ; the rest of the under-parts bright yellow ; ear-coverts amethystine, passing into ruby-red on the sides of the neck, and separated from the hue of the throat by a stripe of glossy purple ; bill dull black ; legs greenish.

Female. Upper-parts glossless olive-green, tinged with grey ; throat and breast as in male, but paler ; under-parts dull greenish-yellow ; wings and tail margined with aureous-green. The young resemble the female, except in the more downy texture of their feathers, and the chestnut colour of the throat and breast is reduced to a slight tinge.

Male, female, and young from Malacca.

Inhabits the Burmese and Malay countries.

190. PRIONOCHILUS PERCUSSUS.

Pipra percussa, Temminck, Pl. Col. 394. f. 2.

Prionochilus percussus, Strickl. P. Z. S. 1841, p. 29.

Dicaeum ignicapillum, Eyton, P. Z. S. 1839, p. 105.

NALOW, Malays (Eyton).

Adult male. Upper parts dull lavender-blue, the lower parts bright yellow, passing to whitish on the lower tail-coverts ; a large igneous-red spot on the vertex, and another along the centre of the breast ; a white streak from the side of lower mandible, divided from the yellow of the throat by another of lavender-blue. Primaries narrowly margined with pale lavender-blue, secondaries with olive-green, and the tertiaries with dull lavender-blue. Bill black above, more or less whitish beneath, legs lead-coloured.

Young male. Upper-parts as in adult, but intermixed throughout with olive-green, igneous spot on vertex smaller and less bright ;

wings margined with olive-green ; white streak from lower mandible and under-parts paler and duller coloured, the igneous spot smaller.

Female. Olive-green above, paler and more yellowish below, with pale yellow along the throat, and darker yellow along the breast ; streak from bill whitish. Coronal spot igneous-yellow. In both sexes the axillaries and under wing-coverts are pure white.

Length about $3\frac{1}{2}$ inches ; wing 2 to $2\frac{1}{4}$ inches ; tail $1\frac{1}{4}$ inch ; bill to gape $\frac{5}{12}$; and tarse $\frac{1}{2}$ inch.

Pinang and Malacca. Common.

191. PRIONOCHILUS MACULATUS.

Pardalotus maculatus, Temm. Pl. Col. 600. f. 3.

Prionochilus maculatus, Strickl. P. Z. S. 1841, p. 29.

Adult. Upper-parts olive-green, the igneous coronal spot pale ; lores dull whitish ; a whitish streak from base of lower mandible separating another of olive-green from the yellowish-white of the middle of the throat ; under-parts yellow, brightest along the middle, and streaked laterally with olive-green. Axillaries and under wing-coverts pure white. Size of *P. percussus*.

From Pinang and Malacca. Also inhabits Borneo.

192. BUTRERON CAPELLII.

Columba capellei, Temm. Pl. Col. 143 ; Knip. et Prev. Fig. t. 38.

Vinago capellei, Cuv. Règ. Anim. i. p. 492 (1829).

Toria capellei, Blyth, J. A. S. Beng. xiv. p. 848.

Vinago giganteus, Vigors, Zool. App. Mem. Raffles, p. 674.

Treron magnirostris, Strickland, Ann. Nat. Hist. 1844, p. 115.

Butreron capellii, Bonap. C. G. Av. ii. p. 9.

From Pinang.

In this species the beak is lengthened by the prolongation of its soft and tumid basal portion, becoming, as remarked by Mr. Strickland, "almost vulturine in form."

Iris blackish-brown ; bill pale yellow ; feet pale orange.—Cantor, MS. Note.

193. TRERON NIPALENSIS.

Toria nipalensis, Hodgson, Asiat. Res. xix. p. 164. t. 9, fig. (1836) ; Blyth, J. A. S. Beng. xiv. p. 847.

THORIA (*i. e.* beaked), Nepal (Hodgson).

KROCHA, Malays (Blyth).

POONAI CAHIO-ARA, Malacca (Cantor).

Green, yellowish beneath and towards the tail ; crown ash-coloured ; mantle of the male, deep marrone-red, and a faint tinge of fulvous on the breast ; primaries and their larger coverts black, the latter margined with yellow ; middle tail-feathers green, the rest with a blackish medial band, and broad grey tips ; lower tail-coverts cinnamon-coloured (more or less deep) in the male ; subdued white, marked with green in the female. Bill greenish-white, with a large vermilion spot occupying the membrane at the lateral base of the

mandibles; legs also vermillion; irides deep red-brown, with a blue inner circle; orbital skin bright green.

Length $10\frac{3}{4}$ by 17 inches; closed wing $5\frac{3}{4}$ inches.

Inhabits the central and lower hilly regions of Nepal, and more abundantly those of Assam, and Arracan, spreading southwards to the Tenasserim Provinces and Malayan Peninsula. It also occurs, says Mr. Blyth, in the hilly districts of Bengal, but rarely strays into the plains, though specimens are occasionally met with even near Calcutta.

194. OSMOTRERON VIRIDIS.

Columba viridis, Scopoli, Del. Flor. et Faun. Insub. p. 94 (1786); Pl. Enl. 138; Sonn. Voy. t. 64, 65.

Columba vernans, Gmel. Syst. Nat. i. p. 789 (1788); Horsfield, Raffles.

Treron vernans, Blyth, J. A. S. Beng. xiv. p. 851; Mosley et Dillwyn, Nat. Hist. Labuan, p. 30.

Osmotreron vernans, Bonap. C. G. Av. ii. p. 12.

Col. purpurea, Gmel. (Brown's Ill. pl. 18).

KATE ♂, JOWAN ♀, Java (Horsf.).

POONAI CROCHI, Malays (Eyton).

POUYE, Malays (Blyth).

Malacca and Pinang. Common.

195. OSMOTRERON OLAX.

♂ *Columba olax*, Temm. Pl. Col. 241; Knip, et Prev. Fig. t. 12.

Osmotreron olax, Bonap. C. G. Av. ii. p. 15.

SEMBOAN, Malays.

Malacca.

Male. The whole head, nape, throat, flanks, rump, and upper tail-coverts ash-colour, palest on the forehead and throat; mantle very dark maroon; wings black, the larger coverts margined with yellow; tail ashy-black, each feather, except the two medial, with a pale tip; breast with a buff-orange patch, passing to green along the middle of the abdomen; tarsal plumes, vent, and under tail-coverts dark cinnamon, mingled on the former with ashy.

Female. Differs in having the forehead and crown only ash coloured; the upper parts being dark green, and the medial rectrices above wholly green, with the two next also greenish basally along the outer web; throat pale ashy, passing to yellowish-green on the breast and middle of abdomen, the sides of the latter, below the ashy flanks, being dark green; tarsal plumes, vent, and under tail-coverts cinnamon-white, mingled on the two former with dark green, the latter dusky along the shafts.

Length about 8 inches, of wing 5 inches, tail 3 inches.

196. RAMPHICULUS JAMBU.

Columba jambu, Gmel. S. N. i. p. 784 (1788); Temm. Fig. t. 27, 28; Raffles, Trans. Linn. Soc. xiii. p. 316.

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POONAI JAMBOO, Sumatra (Marsden ; Raffles).

POONAI GADING, Malays (Eyton ; Cantor).

From Pinang and Malacca.

Adult male. Head deep crimson, this colour extending from the front to the middle of the crown, behind the eyes, and across the ear-coverts to lower part of the throat ; a cinnamon-black stripe down the throat ; hind part of the head, nape, and whole upper parts dark green, but with a buffy caste of plumage ; primaries black, their outer webs dark greenish ; secondaries and tips of primaries narrowly margined exteriorly with buffy-white ; tail green, exterior feathers with the inner webs black, the whole with a broad pale terminal band ; hind part of ear-coverts, sides, and front of neck pure white, passing to buffy-white along the sides of the breast and whole of abdomen, the middle of the breast being of a beautiful suffused-pink colour ; flanks and axillaries greyish-green ; under tail-coverts deep cinnamon.

Female. Wholly green, with the crimson of the head and gular stripe very dull and pale ; abdomen mingled green and buff ; under tail-coverts paler.

Young male. Head and sides of throat greyish-green, gular stripe dark cinnamon ; breast mingled green and pink ; abdomen and under tail-coverts buff-white.

A still younger specimen is like the female, but has no trace of crimson about the head ; the throat being pale cinnamon-brown.

Length of adult about 9 inches ; of wing $5\frac{1}{2}$; tail $3\frac{1}{2}$ inches.

197. CARPOPHAGA SYLVATICA.

Columba sylvatica, Tickell, Journ. As. Soc. Beng. ii. p. 581 (1833).

Carpophaga sylvatica, Blyth, Journ. A. S. Beng. xiv. p. 856 ; Ann. N. H. xix. p. 52 ; Bonap. C. G. Av. p. 33 ; G. R. Gray, List of Columb. Brit. Mus. p. 17.

Carpophaga ænea of India, Auctorum.

Pinang.

"Iris and tarsus palpebrarum and feet crimson ; bill pale crimson, apex light grey."

198. MYRISTICIVORA BICOLOR.

Columba bicolor, Scop. Del. Flor. et Faun. Ins. p. 94 (1786) ; Sonn. Voy. t. 103.

Myristicivora bicolor, Reichenbach, Bonap. C. G. Av. ii. p. 36.

Carpophaga myristicivora (Scop.), G. R. Gray.

Columba alba, Gmelin.

Columba litoralis, Temm. Fig. t. 7.

"Iris blackish-brown. Tarsus palpebrarum cobalt. Bill cobalt, apex of mandibles black. Feet cobalt."

Province of Wellesley.

199. GEOPELIA STRIATA.

Columba striata, Linn. S. N. i. p. 282 (1767) ; Edw. Birds, pl. 16.

Columba malaccensis, Gmelin.

Columba bantamensis, Sparrman, Mus. Carls. iii. t. 67; Horsfield et Raffles.

KATITIRAN, Sumatrans (Raffles).

Pinang.

200. CHALCOPHAPS INDICA.

Columba indica, Linn. S. N. i. p. 284 (1767); Edw. B. pl. 14.

Columba javanica, Gmel. S. N. i. p. 781; Horsfield, Trans. Linn. Soc. xiii. p. 183; Raffles, id. p. 317.

Columba cæruleocephala, Gmel.

Columba superciliaris, Wagler, Syst. Av. Col. sp. 80.

Monornis perpulchra, Hodgson.

Chalcophaps augusta, Bonap. C. G. Av. ii. p. 92.

TAKOAT et POONAI TANNA, Malays.

From Pinang and Malacca. Identical with Indian and Javanese specimens.

"Iris dark brown; bill light scarlet; feet pale lake."—*Cantor's Notes*.

201. TURTUR TIGRINUS.

Columba tigrina, Temm. Pig. t. 43 (1808); Horsf. Trans. Linn. Soc. xiii. p. 183.

Turtur tigrinus, Blyth, Journ. As. Soc. Beng. xxiv. pp. 263, 480.

Turtur chinensis (pt.), Bonap. Consp. Gen. Av. ii. p. 63; G. R. Gray, List of Columbæ, Brit. Mus. p. 42.

DERO seu DERKUKU, Java (Horsfield).

Adult and young.

Specimens procured at Pinang and Malacca.

"This species resembles *T. suratensis*," says Mr. Blyth, "but wants the pale vinaceous spots on the scapularies and wings, whilst it retains the black mesial streaks, which are wanting in *T. chinensis*, Scop. (Sonn. Voy. t. 102): there is also much less ash-colour on the wings than in *T. suratensis*, but it is of the same size as the latter, or much smaller than *T. chinensis* (which last has also deep ash-coloured lower tail-coverts)."

5. REMARKS ON THE HABITS OF A HERRING GULL (*LARUS ARGENTATUS*). BY A. D. BARTLETT.

In calling attention to the singular and remarkable habits of a bird of this species, permit me to give an extract from the 'Garden Guide' of 1852, in order that the origin of this individual specimen may be perfectly known.

"In the beginning of June 1850, a Herring Gull (*Larus argentatus*) hatched out her young ones in the enclosure (No. 17), which is overshadowed by two weeping ash trees. The male bird had assisted her so constantly in incubation, that his strength gave way,

and he died just as the young birds were chipping out of the shell. The female then became restless, left the eggs, and was only induced to resume her place for the few hours which were necessary to complete the hatch by the keeper having arranged the dead body of her mate in counterfeit presentment of the position he generally took up near her when not himself upon the eggs."—*Extract from 'Garden Guide,' 1852*

It will, I hope, be understood that the birds so hatched in 1850 were the parents of the individual whose habits I now wish to record.

This bird was one of two hatched about the latter end of May 1857, and was reared by its parents in the gardens, where it remained during the summer and autumn of that year. At the commencement of the winter he was in the habit of flying about (not having been pinioned), and occasionally staying away a *day* or *two*, then *for a week or more*, returning again generally about feeding-time, and alighting among the other gulls and feeding with them. This continued till the end of March 1858, at which time he disappeared. Nothing more was seen or heard of him until the middle of November 1858, when, to the delight and astonishment of all who knew him, he returned one afternoon at the usual time. *Meeting the keeper with the box of food, he followed him to the enclosure where he was hatched, and settling down among the other gulls, took his dinner as though he had never been away, not appearing the least shy or wild.* Here he remained with his parents and the other gulls, occasionally flying off for a *day* or *two*, until the beginning of February 1859.

He again departed and by many was given up for lost; others, however, thought he might again return. And on the morning of *Saturday last, between eight and nine o'clock*, we were gratified to behold the long-lost Gull making his way to his old quarters much improved in his appearance, having nearly completed his adult plumage. He immediately came down and was greeted by his old friends, who evidently recognized him. He *appeared fatigued and hungry*: I sent for some food, and he came boldly towards us, and fed almost from the hand. As soon as his appetite was satisfied, he walked about, quite at home among the other gulls. Since Saturday I have seen him flying now and then over the Gardens and Park, but returning after a short flight.

In conclusion, I beg to say I am indebted to one of the Society's most careful and very intelligent keepers (B. Misselbrook) for some of the facts which have enabled me to bring before you these very interesting particulars.

6. ON THE MOST EFFICIENT MEANS OF PRESERVING THE EGGS OF BIRDS IN ORDER THAT THEY MAY BE AFTERWARDS HATCHED. BY A. D. BARTLETT.

I believe there are but few persons who are quite satisfied by seeing and examining the dried skins and feathers of birds.

The great desire, therefore, to see, or to possess, in a living state,

these wonderful and generally beautiful creatures, has led me to consider the possibility of preserving their eggs for a sufficiently long period to allow of their being brought from distant places and afterwards hatched. We might thus be able to obtain some of the more delicate species, and many perhaps that a long sea voyage would prevent our obtaining by any other means.

The mere keeping fresh and sweet the eggs of birds has been accomplished in many ways: for instance, they will keep for a long period imbedded in lime and water, or in fat or salt; but by these means the vitality is destroyed. It appears to me, therefore, to be essentially necessary, not only to prevent evaporation, but also to keep the texture and surface of the shell in its pure and perfect condition. To accomplish this object the eggs must be newly laid, or nearly so, and the following is the best method of preserving them.

Obtain the gut of any animal whose intestine is large enough to admit the egg intended to be preserved, and, having carefully cleaned the gut and rendered it free from fat, dry it as much as possible in powdered chalk or other earthy matter. Pass the egg into the gut, tying it close to the shell at both ends of the egg, and hang it up in a *cool, dry place* until it is quite dry. Two, three, or more eggs can be tied in the same gut like a string of beads, or they can be tied separately. When thoroughly dry, they may be packed up in a box with oats, wheat, or any *other dry grain or seeds*, until the box is quite full. The object in having the box full is for the great convenience of turning the eggs. This is accomplished by turning the box bottom upwards, which should be done occasionally. Thus the whole of the eggs may be effectually turned with very little trouble. The eggs thus packed must be kept in a dry, cool place, and ought not to be taken out or unpacked before the means are at hand for hatching them. Upon wishing to place them under a hen, or otherwise, if the dry gut be cut with a sharp knife, it will peel off without in any way injuring the shell of the egg.

I was successful in hatching and rearing the young from some eggs kept three months in this manner, and I have no doubt that under favourable circumstances they may be kept for a longer period.

7. ON THE REPTILES AND FISHES COLLECTED BY THE REV. H. B. TRISTRAM IN NORTHERN AFRICA. BY DR. A. GÜNTHER, FOR. MEMB. ZOOL. SOC.

(Pisces, Pl. IX.)

A small collection of Reptiles and Fishes, made by the Rev. H. B. Tristram in the Desert, southwards of Algeria and Tunis, and kindly forwarded by him for my examination, has served to give valuable information on the southward extent of several known species, and proves to contain two others new to science. The collection is composed of twelve Reptiles and two Fishes, most of the species being represented by several specimens.

REPTILIA.

- | | |
|------------------------------------|----------------------------------|
| 1. <i>Chamæleo vulgaris</i> . | 7. <i>Scincus officinalis</i> . |
| 2. <i>Tarentola mauritanica</i> . | 8. <i>Gongylus ocellatus</i> . |
| 3. <i>Uromastix spinipes</i> . | 9. <i>Seps tridactylus</i> . |
| 4. <i>Agama colonorum</i> . | 10. <i>Coronella cucullata</i> . |
| 5. <i>Lacerta ocellata</i> . | 11. <i>Rana esculenta</i> . |
| 6. <i>Zootoca deserti</i> , n. sp. | 12. <i>Bufo viridis</i> . |

PISCES.

1. *Haligenes tristrami*, n. sp. 2. *Cyprinodon dispar*.

I first proceed to give descriptions of the new species.

ZOOTOCA DESERTI, Gthr.

Diagnosis.—The posterior portion of the vertical shield very narrow, the width of the interorbital space being one-third only of that of the superciliary plate. Twelve longitudinal series of rhombic ventral shields. Above greenish-blue, reticulated with black.

Hab. N'Goussa, oasis between Waregla and the M'zab Country, Southern Sahara.

Description.—This species may be readily distinguished from all the other *Lacertæ* and *Zootocæ* by its very narrow interorbital space. 1. The rostral is obtusely conical. 2. The nostril is formed by three plates: the superior nasal, which forms a suture with its fellow behind the rostral, the first upper labial, and a single small posterior nasal. 3. There are three frontal plates, a single anterior one, six-sided, broader than long, with a longitudinal impression, and a pair of posterior ones. 4. The vertical is cuneiform, its anterior portion being broadest, with a longitudinal impression; it tapers posteriorly, and is very narrow between the orbits. 5. The occipital region is covered by two pairs of plates, one pair behind the other; there is a small plate in the centre of their meeting angles; the plates of the anterior pair are triangular, those of the posterior quadrangular. 6. The roof of the orbit is formed by a pair of semi-elliptical superciliaries, in front of which is a small triangular plate; the orbital margin itself is bordered by two series of very small scales. 7. One loreal and one ante-orbital, the latter being bent on the upper surface of the head, but not reaching to the vertical. The lower eyelid is opaque and covered by very minute scales. There is a long, low, triangular plate below the eye (suborbital), interrupting the series of the upper labials. 8. Four upper labials before, and four much smaller ones behind the sub-orbital. 9. Six lower labials; the chin-shields are arranged as usually in the species of this genus, without showing any peculiarity. 10. The upper portion of the cheeks is granular, like the back; the lower is covered with small plates.

The collar-fold is shallow, and formed by scales of moderate size; a very indistinct groove reaches from one ear to the other across the throat. The upper and lateral parts of the extremities and of the body are granular; the ventral shields are nearly regular rhombs and arranged in twelve longitudinal series. The space between the

symphysis and the vent is covered by rhombic scales, the medial series of which contains the largest, the posterior being as large as one of the ventral shields. The series of femoral pores meet at a right angle.

The fore-leg reaches to the extremity of the snout, if laid forwards, —the hind-leg nearly to the ear.

The ground-colour is bluish-green, the upper parts being reticulated with black ; whitish spots appear on the hind-legs ; the lower side white.

	inches.	lines.
Total length	4	3
Distance between the extremity of the snout and the tympanum	0	5
Distance between the tympanum and the vent ..	1	3
Length of the tail.....	2	7
—— of the fore-leg	0	7½
—— of the hind-leg	1	0½

HALIGENES, Gthr.

Body compressed, rather elevated, covered with cycloid scales of moderate size ; cheeks and opercles scaly ; lateral line interrupted. One dorsal with fourteen spines ; the anal with three. Each jaw with a series of teeth, compressed and notched at the top ; a second series of smaller ones in the upper jaw, separated from the anterior by a groove ; no teeth on the palate. The lower pharyngeal bone triangular, with cardiform teeth. Branchiostegals five ; air-bladder present.

This form belongs to the family *Chromidæ*, and may be distinguished from *Chromis* and *Hemichromis*, Peters, by the teeth, from *Sarotherodon*, Rüpp., by the scaliness of the opercles and by the teeth, from *Glyphisodon* by the lateral line, &c.

HALIGENES TRISTRAMI, Gthr. (Pl. IX. fig. B.)

Diagnosis.—B. 5. D. $\frac{14}{12}$. A. $\frac{3}{9}$. V. $\frac{1}{5}$. L. lat. 28. L. trans. 3/11. Body greenish, with seven or eight dark vertical bars ; an ovate black spot behind the last dorsal spine.

Hab. Salt Lake and ditches of Tuggurt, Eastern Sahara.

Description.—The body is compressed, of semielliptical form, its greatest height, above the root of the ventral, being $3\frac{1}{4}$ in the total length. The profile of the nape of the neck is curved, that of the head straight, obliquely descending downwards. The profile of the back is a slight curve, that of the belly nearly straight. The length of the head is $3\frac{2}{5}$ in the total. It is covered with scales, except on the snout, and on the præorbital, and on the præopercular margin. The snout is rather short, somewhat longer than the diameter of the eye. The mouth is slightly oblique, with the jaws equal anteriorly, and with the upper maxillary reaching to the vertical from the anterior margin of the eye. There is one nostril only on each side, situated midway between the eye and the extremity of the snout. The eye is placed high up the side, but it does not interfere with the upper

profile ; the length of its diameter is $4\frac{1}{4}$ in that of the head, and less than the width of the infraorbital space, which is flat. The præoperculum is much higher than wide, with the posterior margin vertical and with the inferior and the angle rounded. The margins are entirely smooth, and there are no scales between them and the fleshy portion of the cheeks. The operculum and suboperculum are covered with large scales ; the former is rounded posteriorly, the latter has a shallow notch before the root of the pectoral.

The *dorsal* fin begins in the vertical from the base of the pectoral and terminates in that from the twenty-second scale of the lateral line. The upper margin is nearly straight, the soft portion, however, being elevated ; it is entirely scaleless. The spines are of moderate strength ; they increase in length from the first to the last, the length of which is one-half that of the head. The membrane between them emits a short filament behind every one. The anterior rays continue to increase in length to the sixth, which forms the highest portion of the fin, its length being four-fifths that of the head. The following rays become rapidly shorter. The *caudal* is subtruncated and covered with small scales at the base ; its length is one fifth of the total. The *anal* begins in the vertical from the second dorsal ray, and terminates very little before the dorsal ; the margin of its soft portion is rounded ; it is, like the dorsal, entirely scaleless ; the spines are stronger than those of the dorsal ; the third is the longest, its length being $2\frac{1}{2}$ in that of the head. Of the rays, the third and fourth are the longest, two-thirds the length of the head. The *pectoral* is composed of fifteen rays, pointed, rather elongate, and reaching to the second anal spine. The *ventrals* are inserted somewhat behind the pectorals, and reach to the vent ; their spine is of moderate length and strength.

The *scales* are cycloid, rather higher than wide ; one of the largest covers two-thirds of the orbit. The lateral line originates in the scapular region, and runs from hence parallel to the dorsal line ; it approaches the end of the dorsal, where it ends. The posterior part of the lateral line commences in the vertical from the third dorsal ray, there being four longitudinal series above it, and runs straight along the middle of the tail.

Both the jaws are armed with a series of *teeth*, slightly compressed at the tip, and distinctly notched ; the tips are of brown colour. A second series is separated from the first by a groove, in which the mandibular series is received. This second series is formed by very small teeth, similar to the others. The palate and the tongue are toothless. The lower pharyngeal bone is single, triangular, and armed with small cardiform teeth.

There are four gills, a slit behind the fourth. Pseudobranchiæ none.

The *ground-colour* is greenish, shining silvery on the sides, and on the belly. The body is crossed by four, the tail by three darker bands ; there is another band across the neck, and a narrower one between the orbits ; a dark streak between the eye and the posterior extremity of the operculum. The vertical fins are transparent, with indistinct, dark, oblique streaks ; an ovate black spot behind the base

of the last spine. The pectorals are colourless, with blackish root ; ventrals blackish.

	inches.	lines.
Total length	5	2
Height of the body	1	7
Length of the head	1	5
Diameter of the eye	0	4
Length of the last dorsal spine	0	8½
—— of the sixth dorsal ray	1	1
—— of the caudal	1	1
—— of the third anal	0	7
—— of the fourth anal ray	0	11
—— of the pectoral	1	3
—— of the ventral	0	11
—— of a large scale	0	2¾
Height of a large scale	0	3

The intestines are not in a good state of preservation ; they make many convolutions ; if there is a pyloric appendage, it must be a single one. The air-bladder is bifurcate anteriorly, each lobe being continued to the skull. The development of the organs of reproduction shows the maturity of the specimens.

The "belief" has been expressed that "the Algerian mammals and reptiles are entirely distinct from those of the opposite coast*." Now, in the first place, naturalists never ought to "believe," especially when it is easy to find the necessary information by personal examination or by consulting authorities on the subject. A single glance at any of the herpetological accounts of Algeria would have awakened considerable doubts in the mind of the reviewer of Mr. Bree's 'Birds of Europe;' for, as far as I am aware, every Herpetologist's opinion on the matter, *gained from facts*, has been, and is, that the main body of the reptiles all round the shores of the Mediterranean is entirely the same. So, for the information of those who are not well acquainted with the geographical distribution of reptiles, I add the following notes, which show that even of the species collected by Mr. Tristram in more southern parts of the Sahara than those which were visited by previous naturalists, not less than seven are found on the European side, namely :—

Chamæleo vulgaris, in Sicily and Spain, to 38° lat. N.

Tarentola mauritanica, *Lacerta ocellata*, *Seps tridactylus*, in the islands and peninsulas of the Mediterranean and in the South of France, to 43° lat. N.

Gongylus ocellatus, islands of the Mediterranean (Spain ?), to 42° lat. N.

Rana esculenta, Europe ; Northern Asia to 60° lat. N.

Bufo viridis, Europe to Denmark and Sweden, to 60° lat. N.

Thus, by means of Mr. Tristram's collection, our knowledge has advanced one step further, as it is proved that the European Amphibio-fauna extends beyond the Atlas towards the heart of the Desert.

* In the 'Ibis,' a Magazine of General Ornithology, vol. i. pp. 93, 156, 157.

I, at least, am not able to point out any difference of the slightest importance between European, Cis-Atlantean, and Trans-Atlantean specimens in any single species. But, supposing there were persons who had the hardiness to distinguish specifically these animals, what other result would be gained for science than that of the existence of two series of species (one north, the other south of the Mediterranean), so extremely similar, that, except from knowing the locality, nobody could make them out? No peculiarity in the feature of the North African fauna would be expressed by it, and North Africa would continue to belong *zoologically*, and not merely *ornithologically*, to the Palæarctic Region. No other fact proves this so well as that of the presence of Tailed Batrachians in these countries.

If we ask for the boundary between the Faunas of the Palæarctic and Æthiopian Regions, it is like the water-shed between the systems of two rivers: tributaries of the one extend far within the reach of the other. Nevertheless, we must draw such a line, and, the reptiles collected by Mr. Tristram being identical with those north of the Atlas, it cannot be found in the tract of those mountains, but it must be transferred into the Desert itself*. Probably the Æthiopian fauna penetrates into the Desert from the South, similarly as the European from the North; and some future attempt at a general account of the fauna of the Sahara may be drawn up according to the three categories:—

1. Animals generically and specifically belonging to the Palæarctic Fauna.

2. Animals generically and specifically belonging to the Æthiopian Fauna.

3. Animals generically peculiar to the desert.

The new genus of fishes described above appears to belong to the latter category. It is remarkable from its habitat in ditches the water of which is impregnated with the salt of the desert. The fishes most closely allied to it live in the seas round the coasts of Africa, viz. *Chromis* in the Mediterranean, *Sarotherodon* and *Hemichromis* on the coast of Guinea, *Glyphisodon* in the tropical seas of the west and east. To judge from the description, we find a similar fish, though certainly different, perhaps a *Chromis*, indicated by Lacépède (Hist. Nat. Poiss. iv. p. 161), with the name of *Sparus desfontainii*. It is said to be found in the warm springs of Cafsa near Tunis, the water of which has a temperature of 30° R., and does not contain mineral ingredients. He states further that the same species is found in ordinary fresh water also at Tozzer. This would be not improbable. The other fish, *Cyprinodon dispar*, found by Mr. Tristram in the hot springs of Sidi Ohkbar, with a temperature of 80° F., and by Dr. Rüppell† in those of Tor (27° R.), lives also in ordinary fresh waters of the oases of Egypt, of Abyssinia, and Syria‡. This is a viviparous fish.

* Cfr. Wallace in 'Ibis,' 1859, p. 449.

† Rüppell, Atlas Fische, p. 66 (*Lebias dispar*).

‡ Cuv. et Val. xviii. p. 161 (*Cyprinodon lunatus* and *moseas*).

8. NOTES ON THE REPTILES AND FISHES OF THE SAHARA.

BY THE REV. H. B. TRISTRAM, F.L.S.

UROMASTIX SPINIPES, "*Ed D'Abb*," Arab.

Long since described by Freytag, "*Lacerta Libyca seu Arabica*, genus distinctiore corpore et cauda, eademque esculenta, et ob carnem delicatorem expetita."

It also attracted the notice of Leo Africanus, who gives a long and somewhat tedious account of its habits (vol. i. p. 307), mingling some Arab fables with his own observations.

It is found throughout the whole of the Algerian and Tunisian Sahara, but is most common in the south, living either in holes of the rocks, or in burrows of its own in the sand. I have seen specimens measuring 2 feet in length. Its colour during life is grass-green (of a darker hue in the young, but very bright in the adult), spotted with brown, and paler under the belly. When provoked and irritated the adult's bright hue becomes rapidly darker. It is a very inoffensive creature, and moves very slowly and awkwardly, with the gait attributed to the crocodile, and turns its head from side to side with great caution as it walks. Its tail forms its weapon of defence, and it uses it with effect on any pursuer. It seldom bites, but when it does, nothing will induce it to relinquish its grasp. It is almost impossible to force its mouth open. It never drinks. The Arabs believe that water is certain death to it.

It is frequently kept in confinement for fattening among the Beni M'zab, who consider it very good eating. I found it really very palatable when stewed, not unlike tender chicken. I kept several for some time, and one in particular, which became familiar and showed attachment to those whom it recognized. I also saw one kept in an artillery barrack in Algiers, who recognized his owner's voice, and would come to him, climb up his body, and nestle on his shoulder. It appears to be neither strictly nocturnal nor diurnal in its habits, but mine always basked in the morning sun, and retired to sleep in the shade about noon. I have often watched my special pet asleep both by day and night, with his nose and fore feet resting against the wall, his hind-feet hanging down, and the tail stiffened, supporting the body, which was nearly perpendicular to the floor.

The D'Abb has no cry, and, as far as I could observe, lives on friendly terms with individuals of the same species. The Arabs declare that it is a match for the Horned Viper (*Cerastes*), which often enters its holes, but soon has its vertebræ dislocated by the vigorous blows of the D'Abb's prickly tail.

My specimen fed generally on insects, and was an adept at catching flies, but it would also eat several plants, and among these *Peganum harmala*, and *Tragopogon crocifolius*, which seemed its favourite vegetable.

SCINCUS OFFICINALIS, "*H'out el ber*," "*Land-fish*," Arab. "*Cherchiman*," "*Choromcham*," Berber, are the collective names.

The male is distinguished in Arabia as "*Zanarout*," the female as

"*Zelgaga*." The male is decidedly larger than the female, and has its shoulders and sides covered with blackish spots, while the female is of a uniform sand colour. I never observed it among rocks or elsewhere than in the sands of the Sahara, in some parts of which it literally swarms. It hybernates under ground through the winter, when it can easily be dug out of its holes. In summer it may constantly be seen basking in the sun, and attracting attention by the glittering of its bright scales. I have also frequently observed it by moonlight. When alarmed, it wriggles for a moment and disappears beneath the sand with a magical rapidity.

Its food appears to consist exclusively of beetles, ants, and other insects, and the Arabs state that it often devours even scorpions.

It is a very favourite article both of diet and medicine, and in many of the oases, as Waregla and Touat, its capture is the occupation of a considerable portion of the population. Fried fresh with *ghee*, it is by no means an unsavoury dish, as I can vouch from experience, but I cannot say as much for the paste into which it is usually made up. The Arabs skin and dry it in large quantities, then pound it very fine in a mortar, after which it is mixed with a mass of stoned dates, and compressed very tightly in skin-bags, when it keeps fresh for months, and is a not unimportant article of commerce with the Touat Caravans, and with the Chambâa of Metlili.

CHAMELEO VULGARIS.

Occurs generally among the Tamarisk trees of the Weds, and is more abundant in the north than in the south of the Sahara. It may often be observed hanging motionless by its tail from a topmost bough. I frequently kept them alive for some time, when they fed themselves on mosquitoes; but the cold of the Tell proved fatal, sooner or later, to all my specimens.

LACERTA OCELLATA, "*H' Ardoun* and *Boulié*," Arabic.

In habits and resorts like our common Lizard. I have watched it climb trees and attack the nest of *Aëdon galactodes*.

SEPS TRIDACTYLUS.

Does not occur in the sand, but only among vegetation. I never observed it take refuge in holes or under ground, but only among the roots of grass or rushes. It moves with great rapidity, twisting itself more after the fashion of a serpent than a lizard. Its bite is perfectly harmless.

TARENTOLA MAURITANICA.

Resorts chiefly to the base of the cliffs in the weds and gorges of the M'zab. Though not uncommon, it is not easy to detect, covered as it usually is with the sand and *débris* of the limestone.

HALIGENES TRISTRAMI, Günther.

This fish is found in great abundance in the salt lake near

Tuggurt, and in the deep ditch which surrounds the city. The lake and ditch abound in small weeds, round the stems of which great numbers of a species of *Melania* and *Paludina nana* (?) cluster. This lake is the only one with which I am acquainted in the Eastern Sahara (except that near Waregla) that is never dry in summer. It is intensely saline, and the whole surface of the sand, for some miles round, is covered with a delicate incrustation of salt, and glitters like a vast sheet of water in the distance. As it is considerably lower than the Mediterranean, and probably the lowest depression in the whole Sahara, may not this fish be the last lingering living relic of those forms which must have swarmed in these seas during the Tertiary epoch, and before the great and gradual elevation of Northern Africa drained this ocean into the Mediterranean by the Gulf of Cades? It seems probable that this gulf between Tunis and Tripoli formed the outlet, since on this coast, for a space of near 200 miles, there is no high land between the Mediterranean and the Desert,—merely long ranges of drifting sandholes about 300 or 400 feet high, —while between Tuggurt and Souf the level of the land is calculated to be 70 feet below that of the sea.

As Lacépède has mentioned a fish of the same family, "*Sparus desfontaini*," in the springs of Cafsa, or Gafsa, not 200 miles from Tuggurt, we may reasonably anticipate that a more persevering search than I had time to make will reveal some similar inhabitant of the Waregla lake.

The following list of additions to the Society's Menagerie by presentation and purchase during the month of November was read:—

1 Entellus Monkey	<i>Presbytes entellus</i>	India.
30 Roach.....	<i>Leuciscus rutilus</i>	England.
5 Perch	<i>Perca fluviatilis</i>	England.
3 Bleak	<i>Leuciscus alburnus</i>	England.
2 Pike	<i>Esox lucius</i>	England.
1 Egyptian Goose.....	<i>Chenalopex ægyptiacus</i>	S. Africa.
1 Ocelot	<i>Felis pardalis?</i>	Guiana.
1 Malbrook Monkey.....	<i>Cercopithecus cynosurus</i>	W. Africa.
1 Coral Snake	<i>Oxyrrhopus trigeminus</i>	Pernambuco.
Pectens	<i>Pecten varius</i>	Tenby.
Lucernariæ.....	<i>Lucernaria auricula</i>	Tenby.
1 Striped Hyena	<i>Hyæna striata</i>	Egypt.
1 Roe Deer	<i>Cervus capreolus</i>	England.
2 Bean Geese	<i>Anser segetum</i>	England.
2 Barnacle Geese	<i>Bernicla leucopsis</i>	England.
15 Carolina Ducks	<i>Aix sponsa</i>	N. America.
1 American Bear	<i>Ursus americanus</i>	N. America.